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Marine Engineering

And Shipping Age

Vol. XXVI

SEPTEMBER, 1921

No. 9

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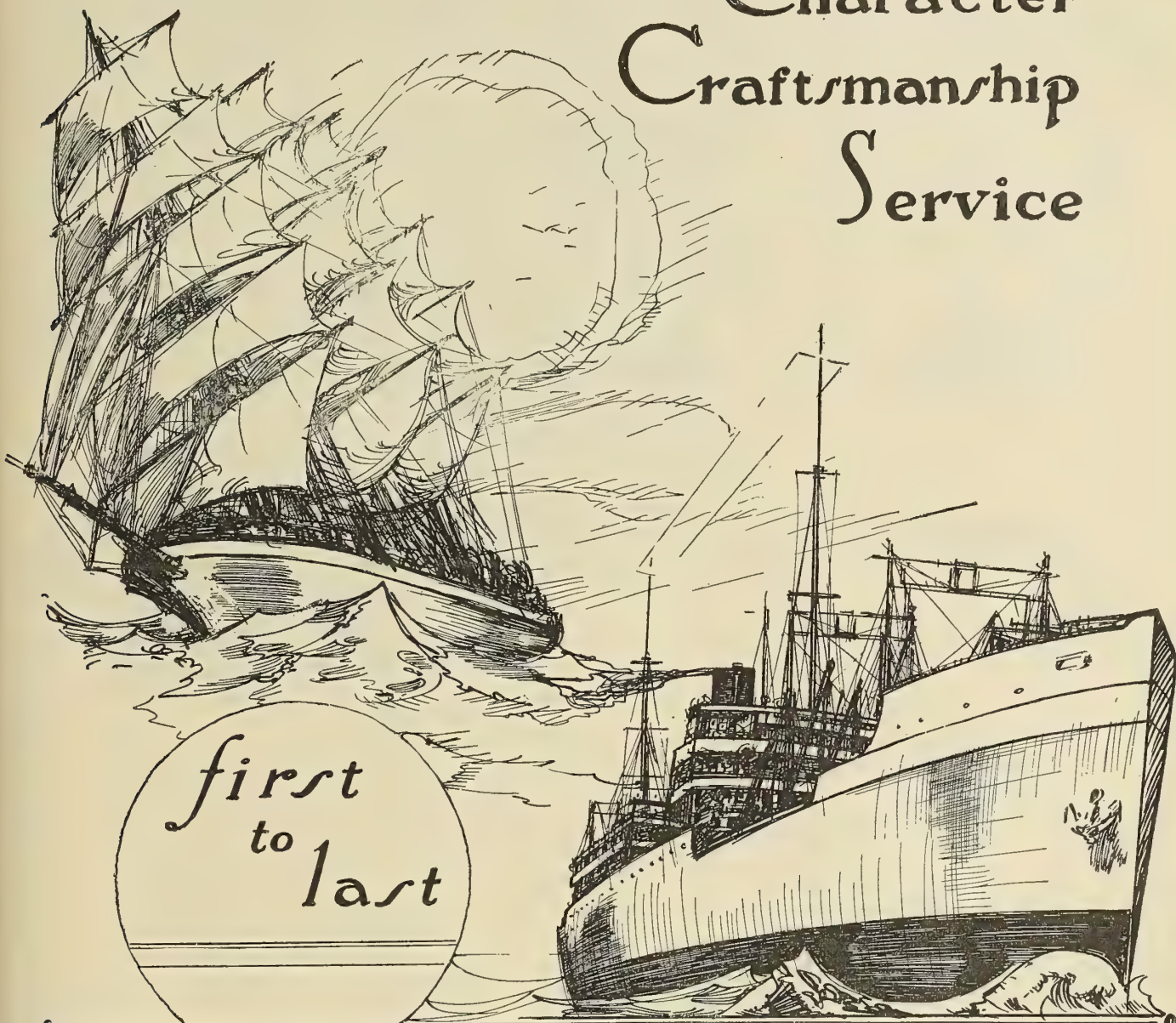
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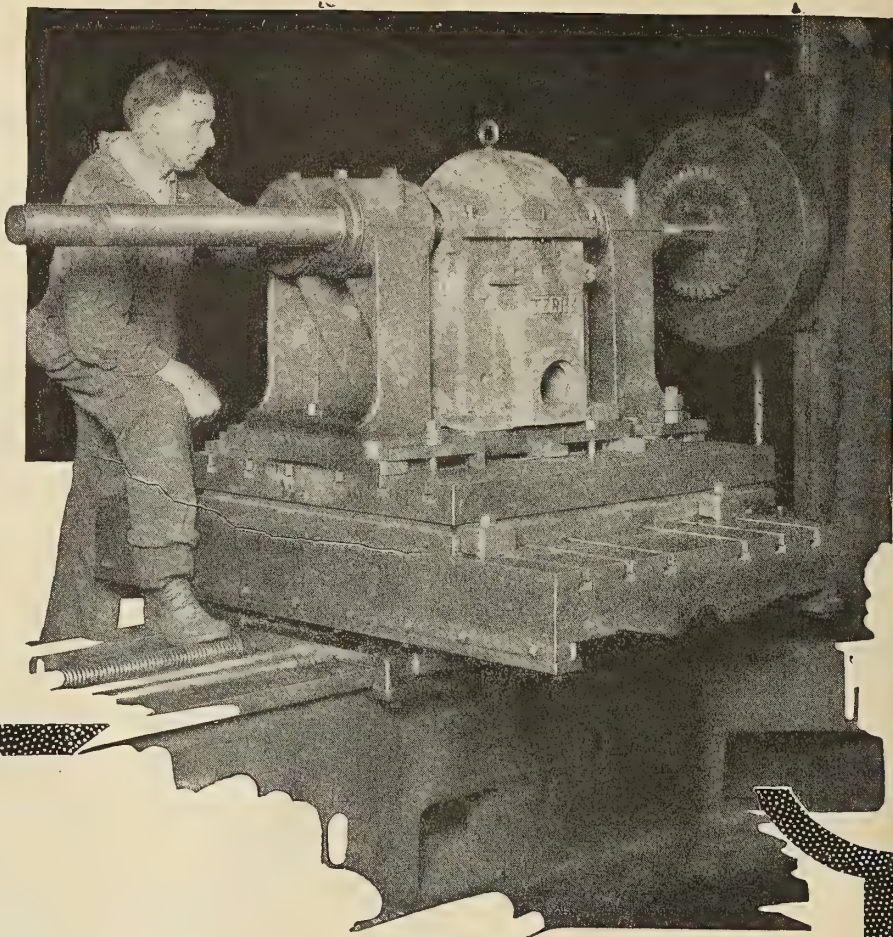
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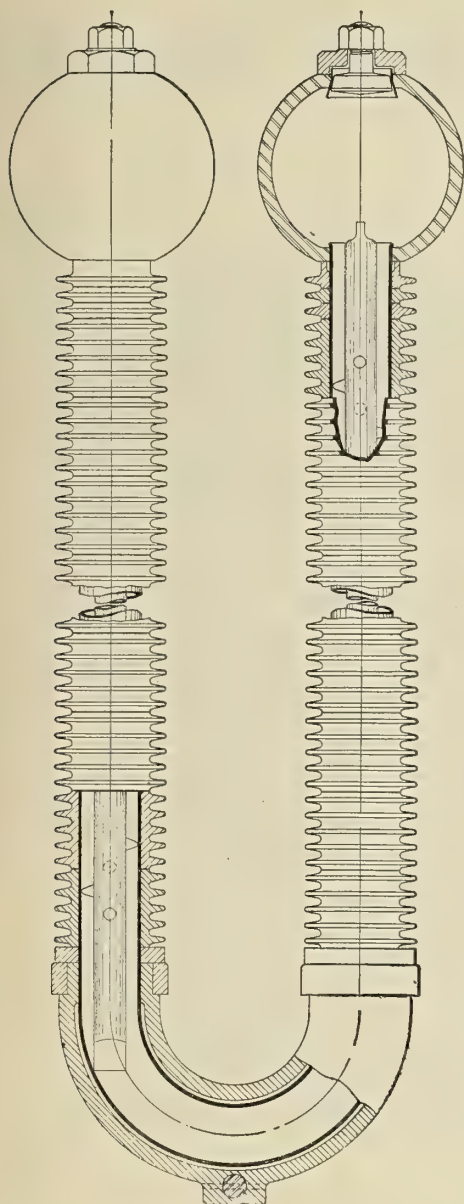
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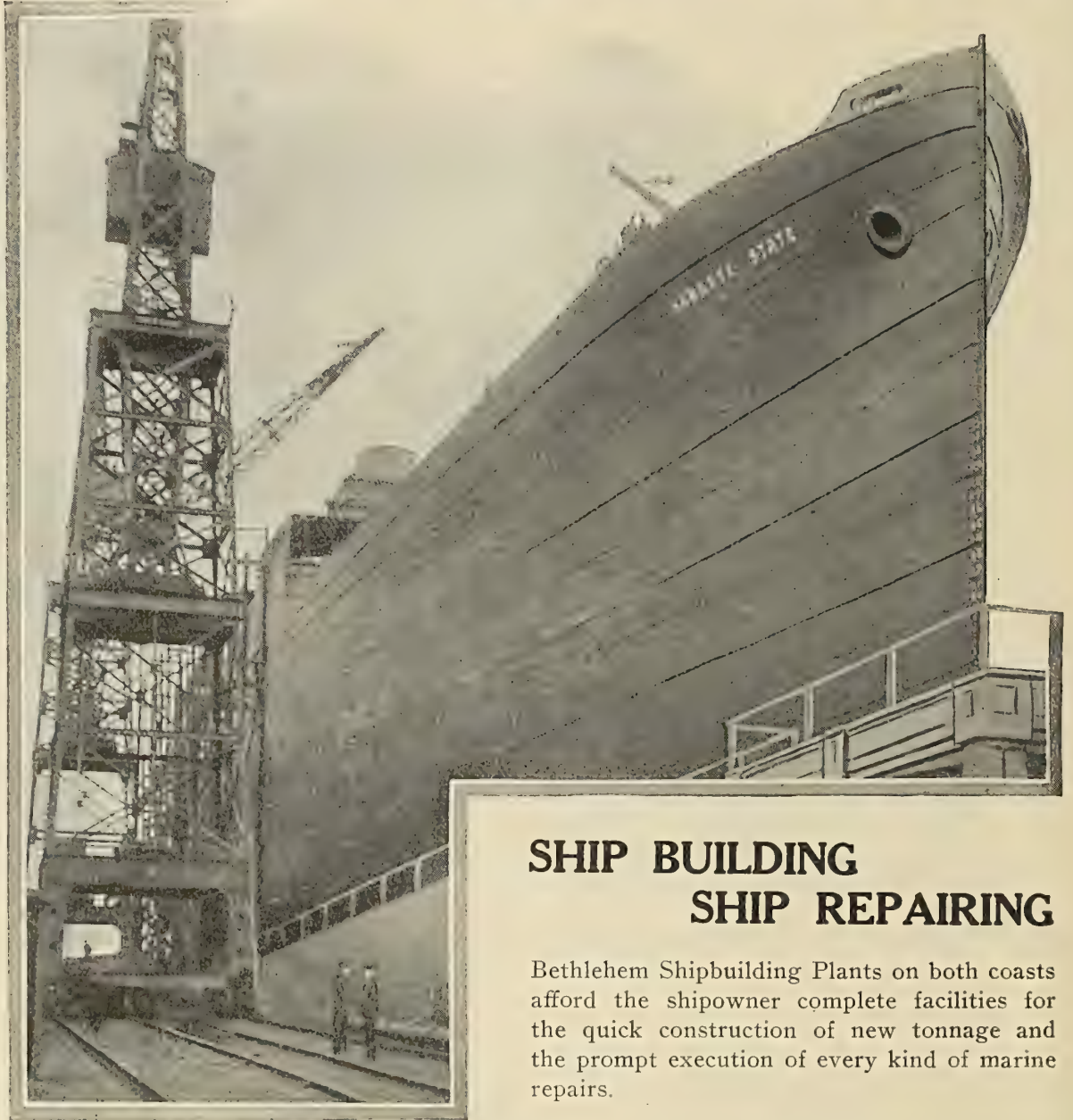
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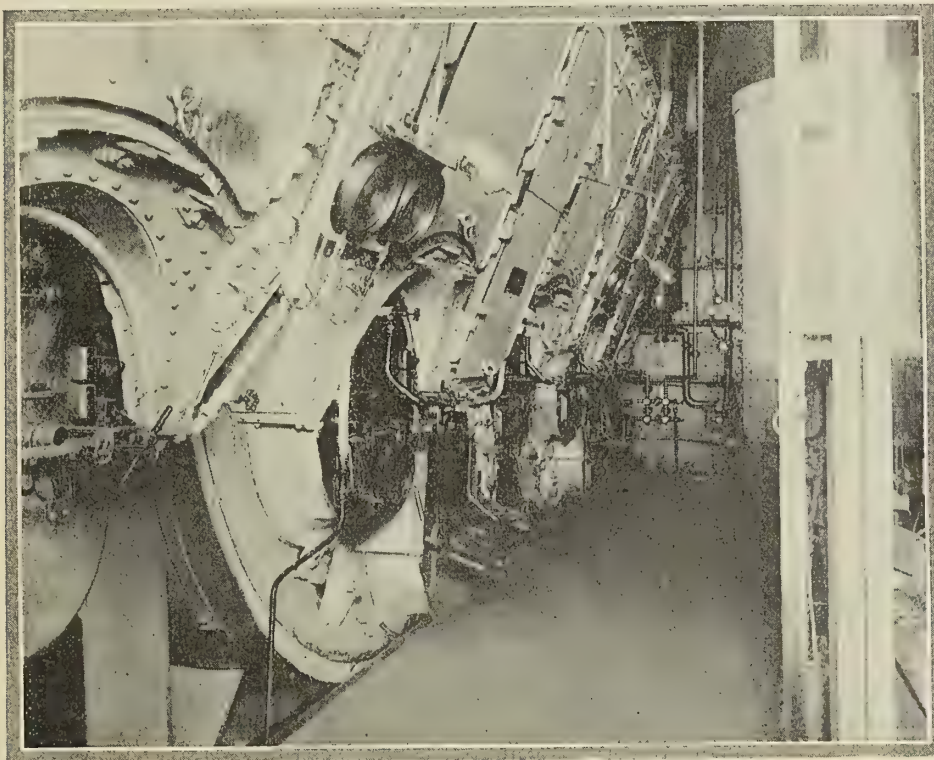
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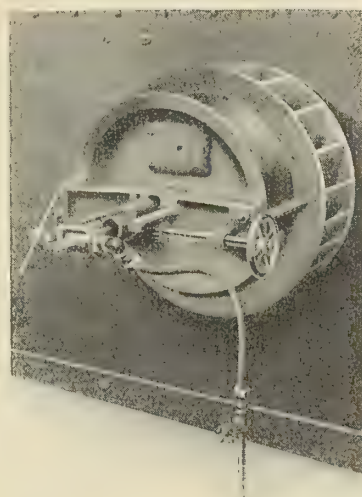
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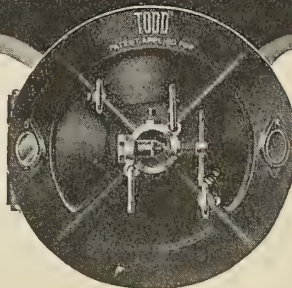
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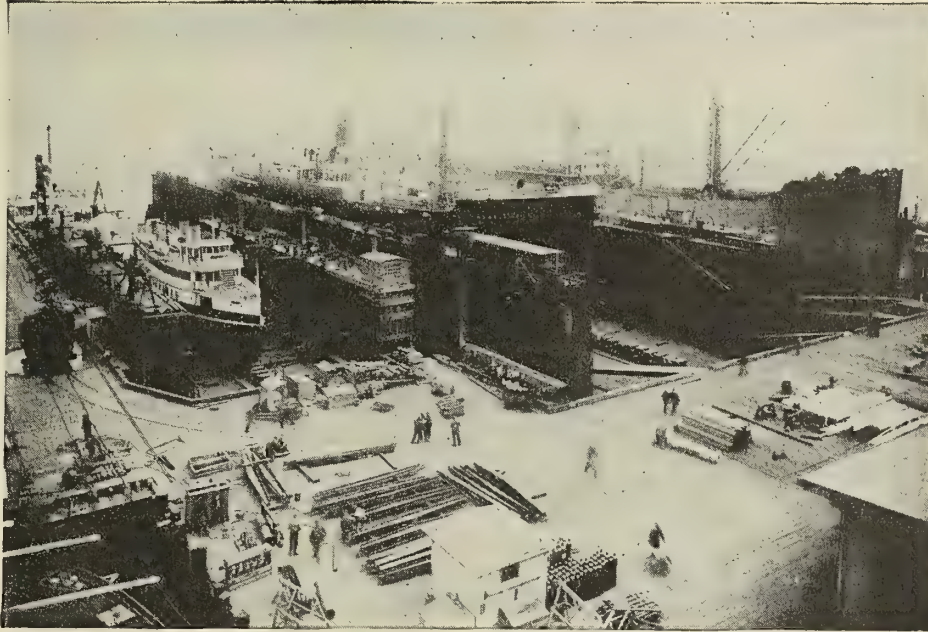
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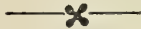
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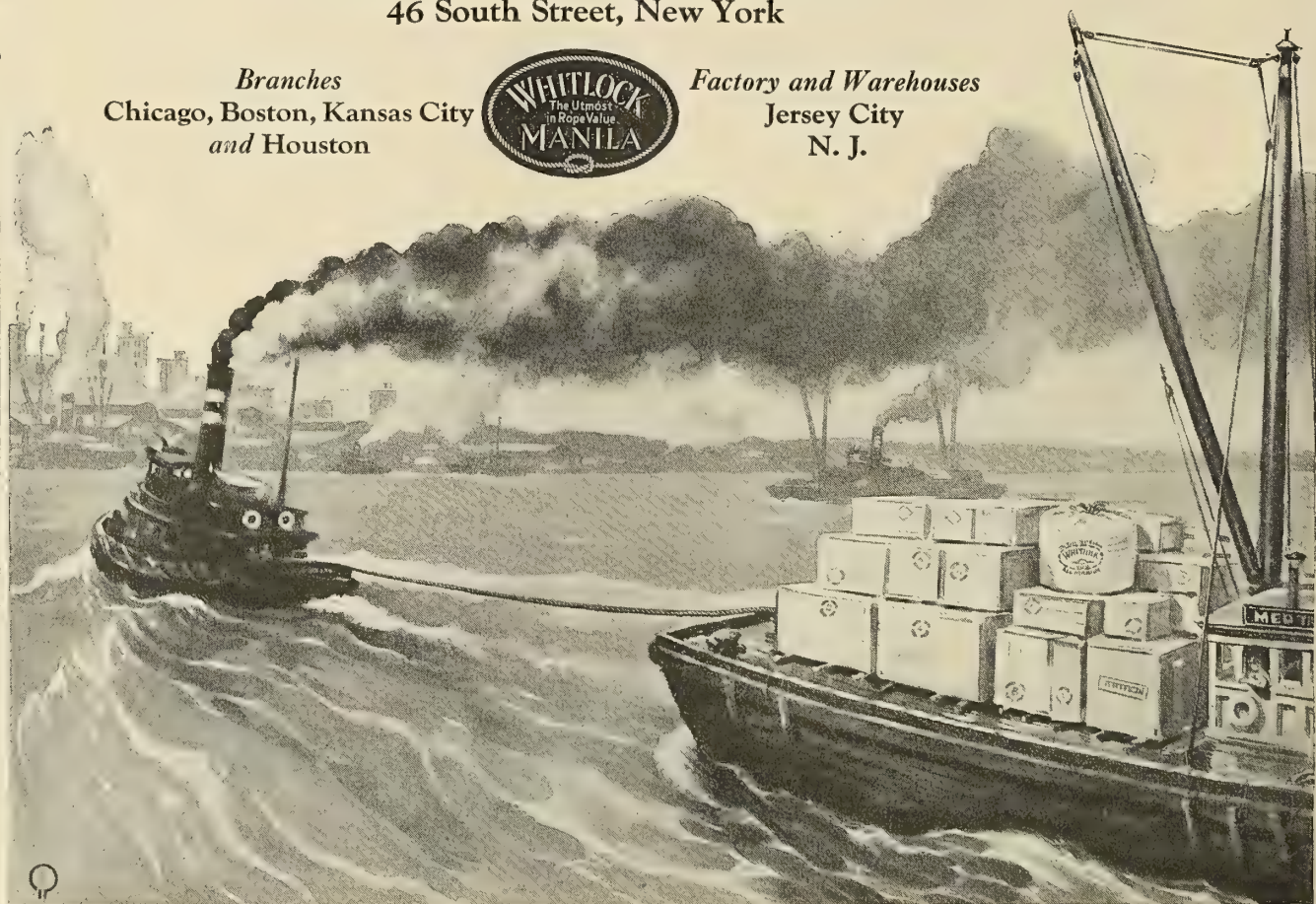
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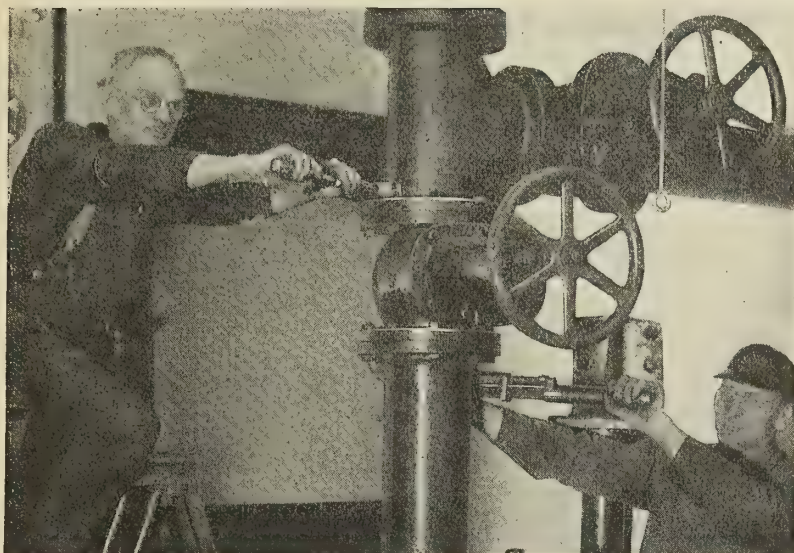


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CUT EXPENSES



Showing difficulty in removing gate valve from pipe line.

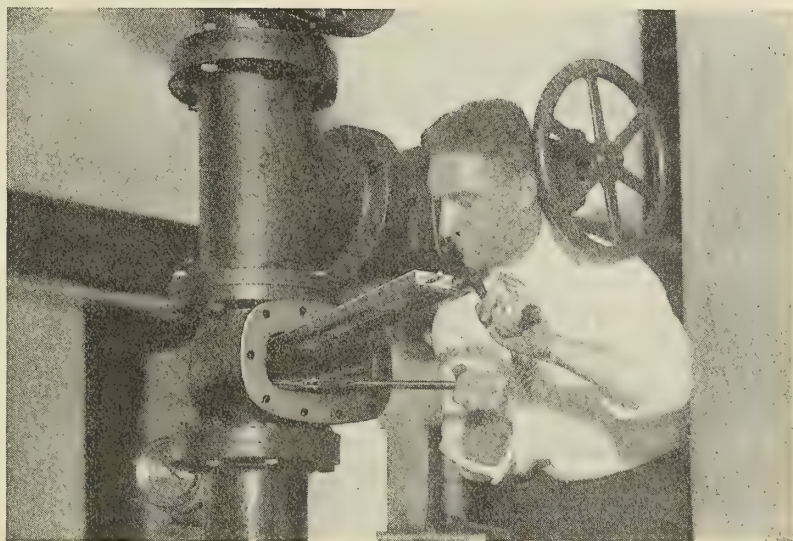
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Showing Dexter Gate Valve Reseating Machine in use on the pipe line.

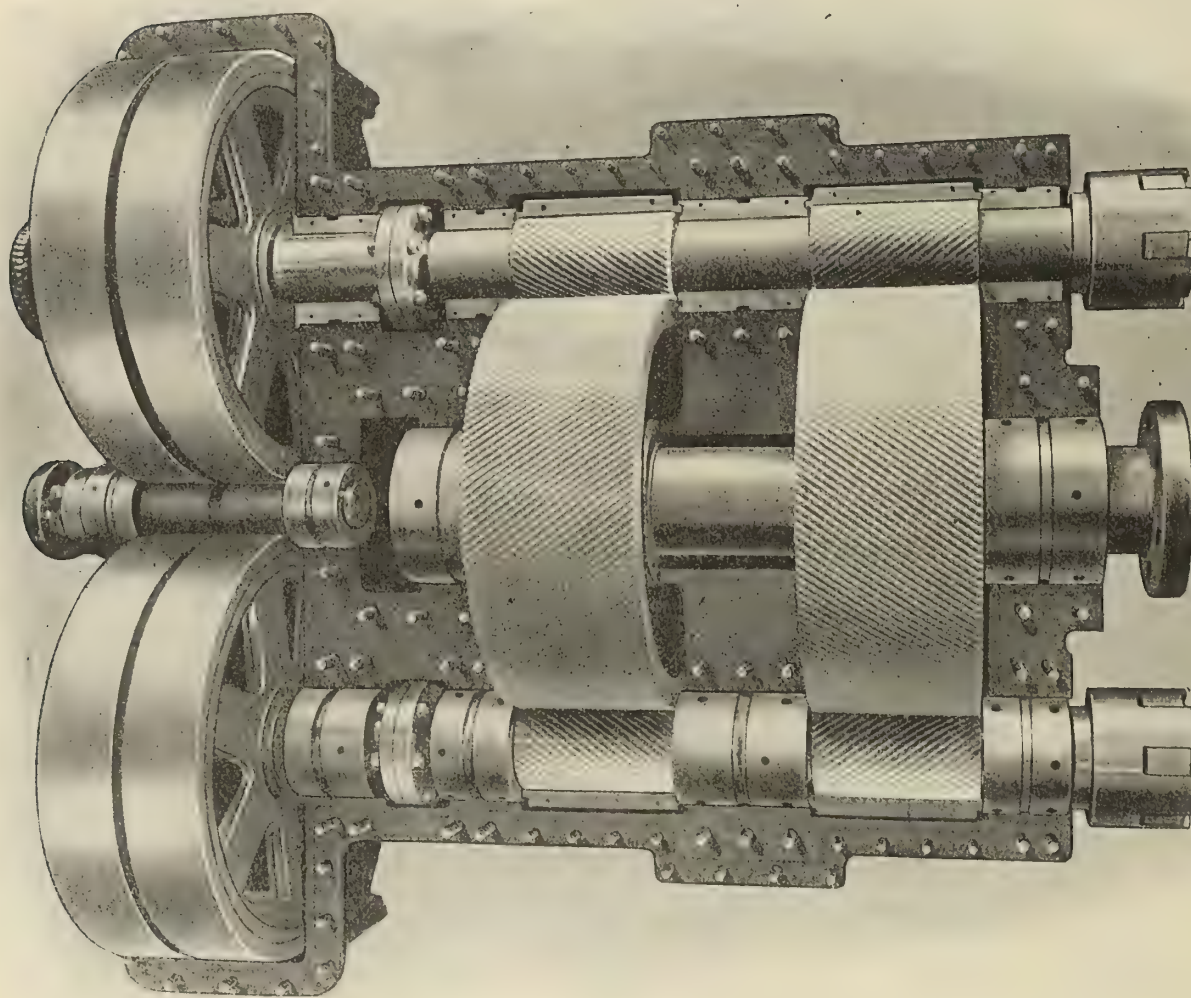
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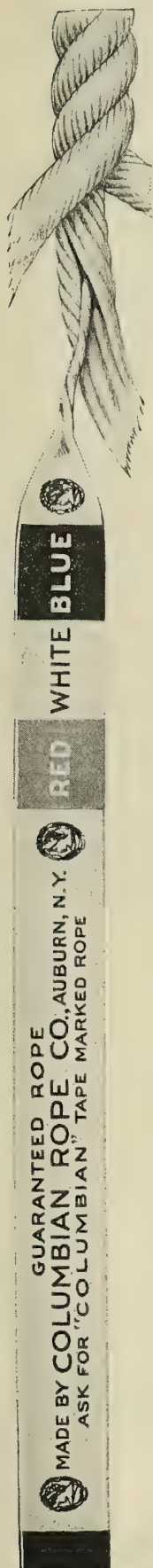
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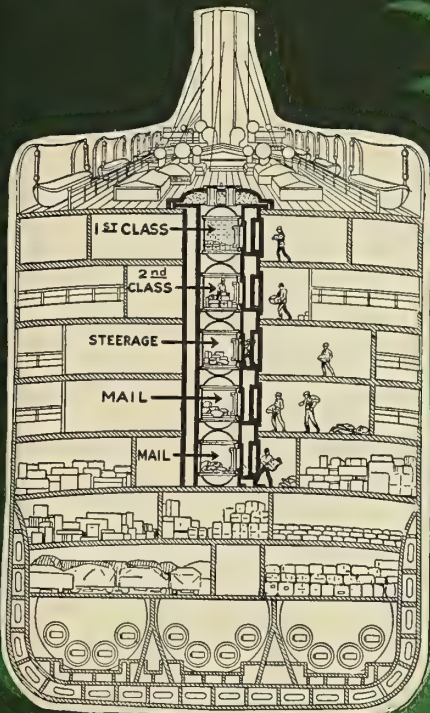
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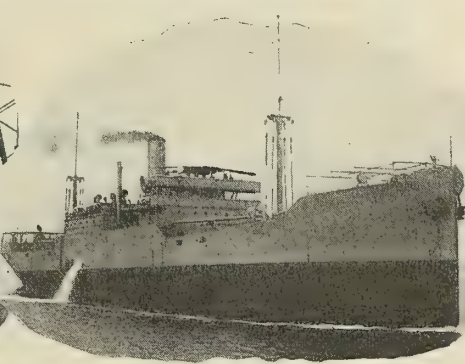
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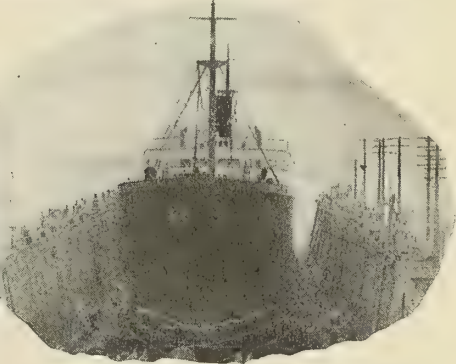
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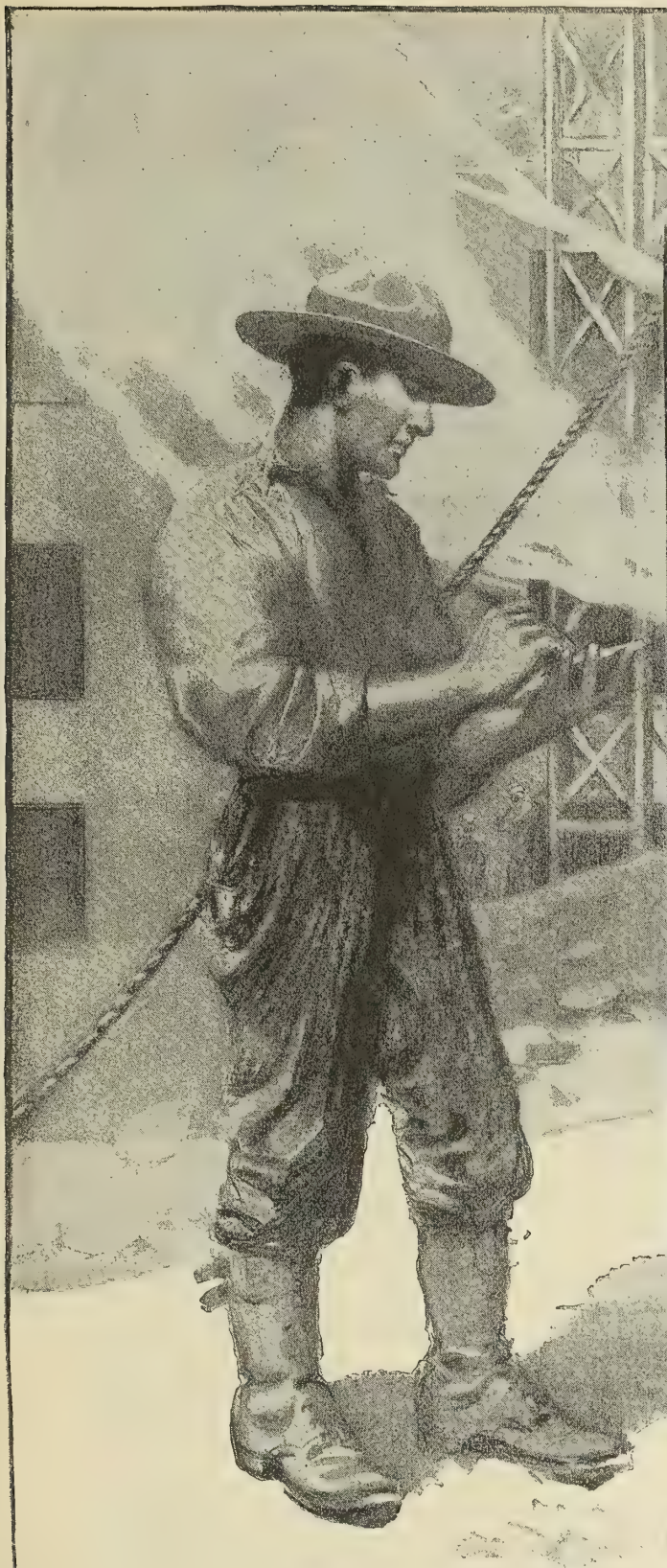
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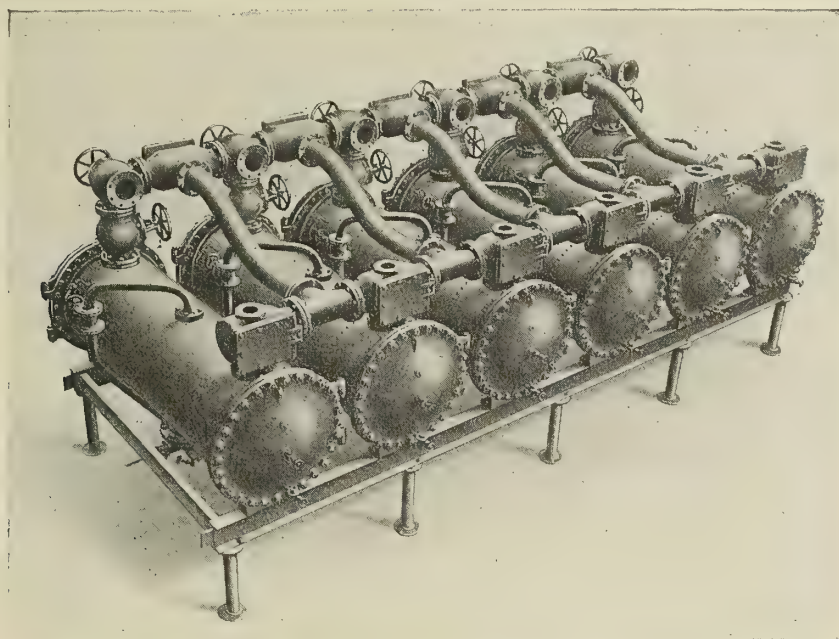
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Many other interesting features of Lillie Evaporators for marine work are described in our Lillie Booklet, "Distilled Water for Boiler Make-Up Feed" and in our Bulletin 114.

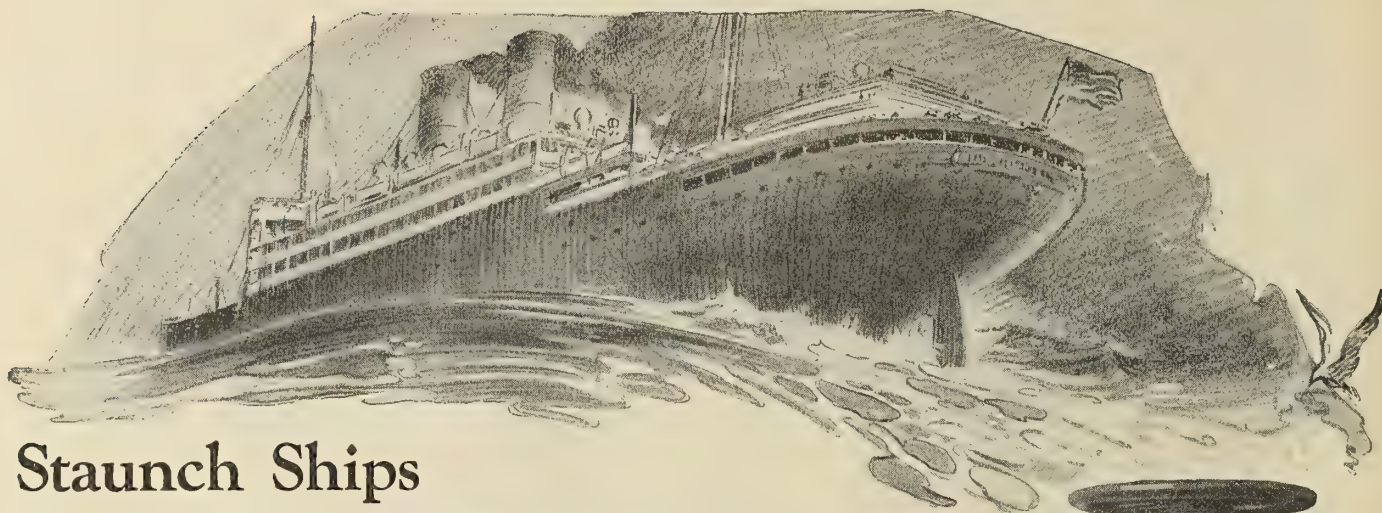
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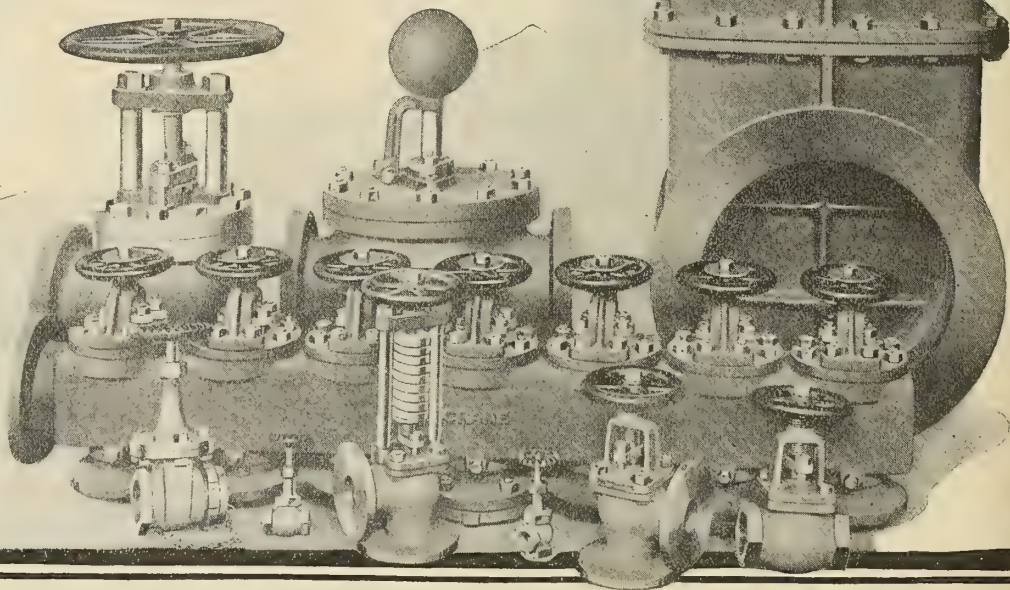
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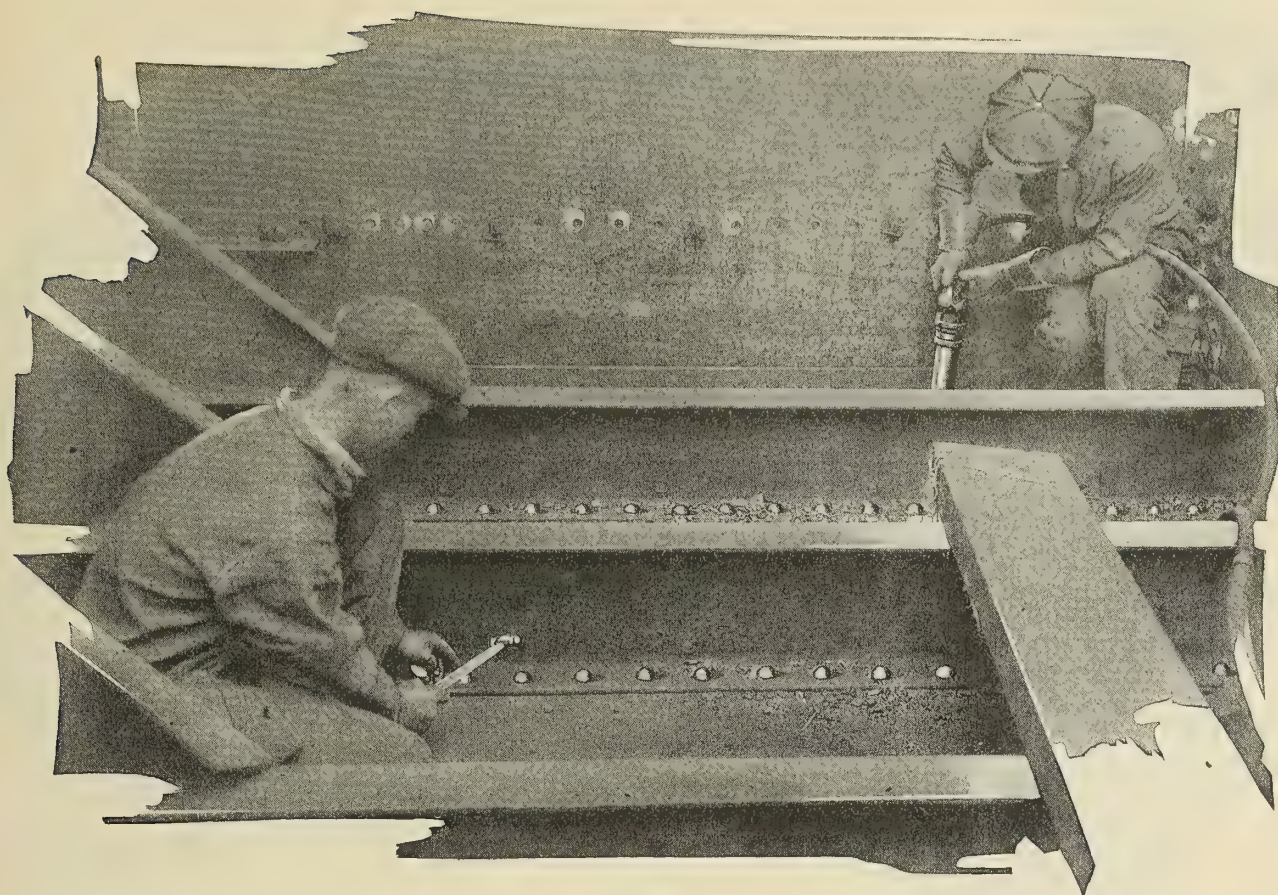
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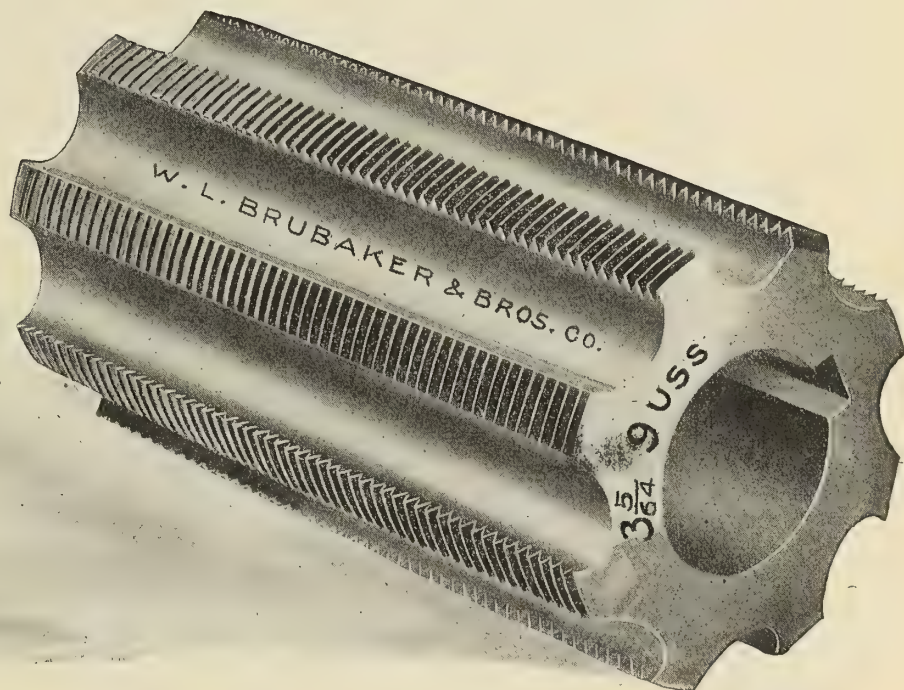
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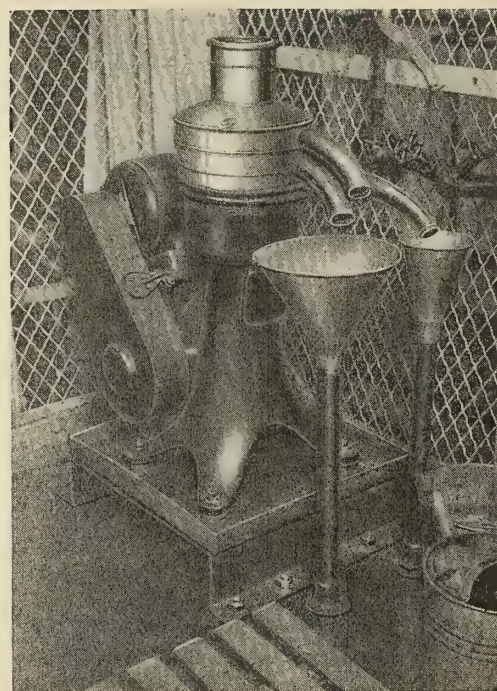
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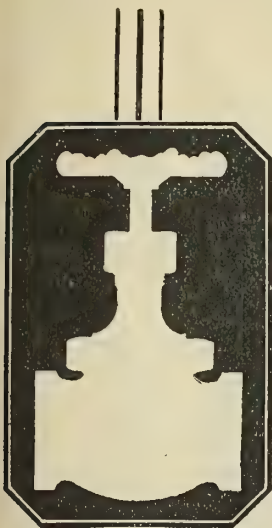
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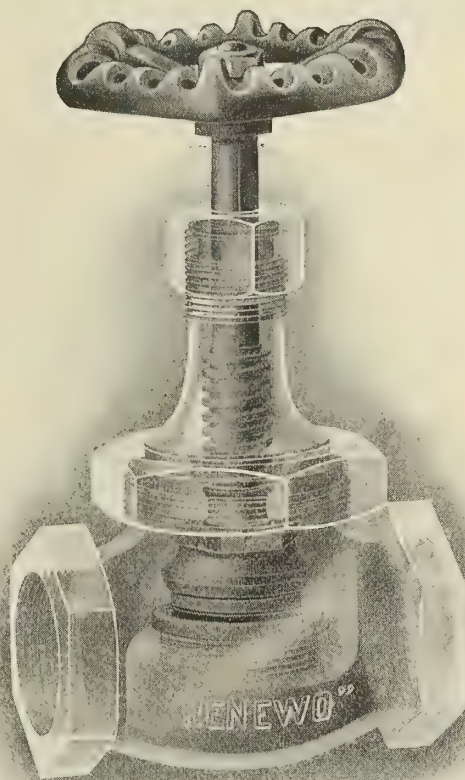
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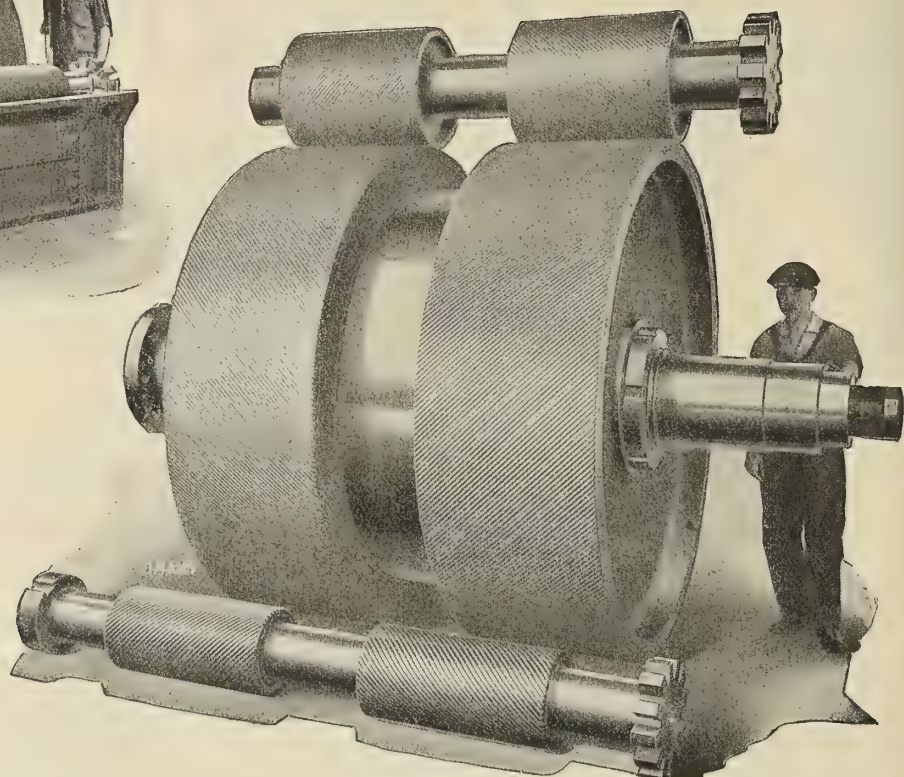
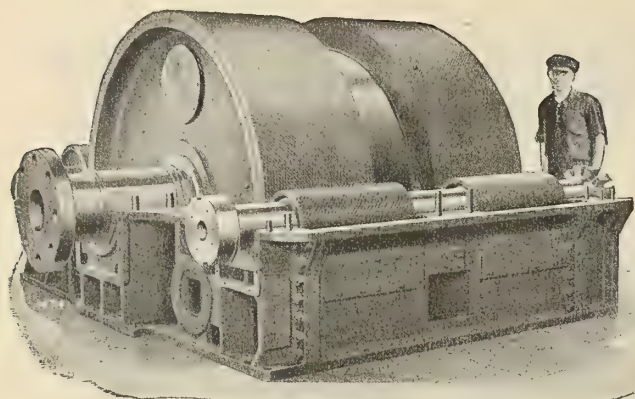
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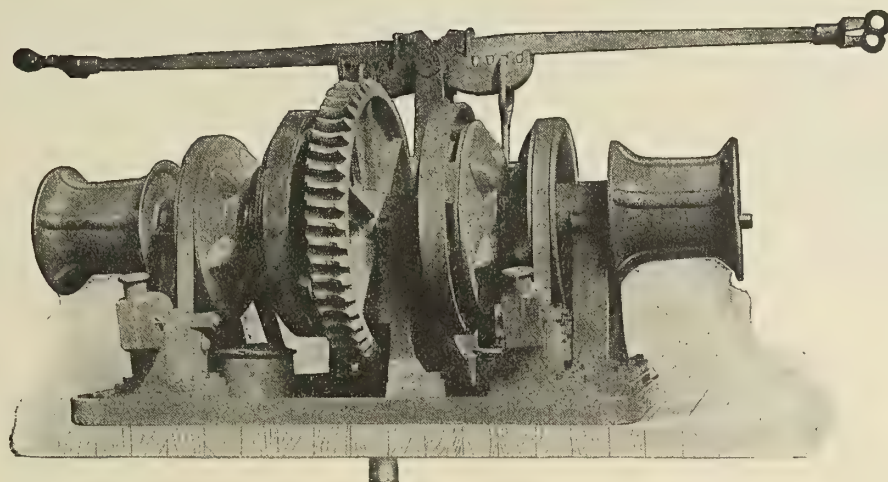
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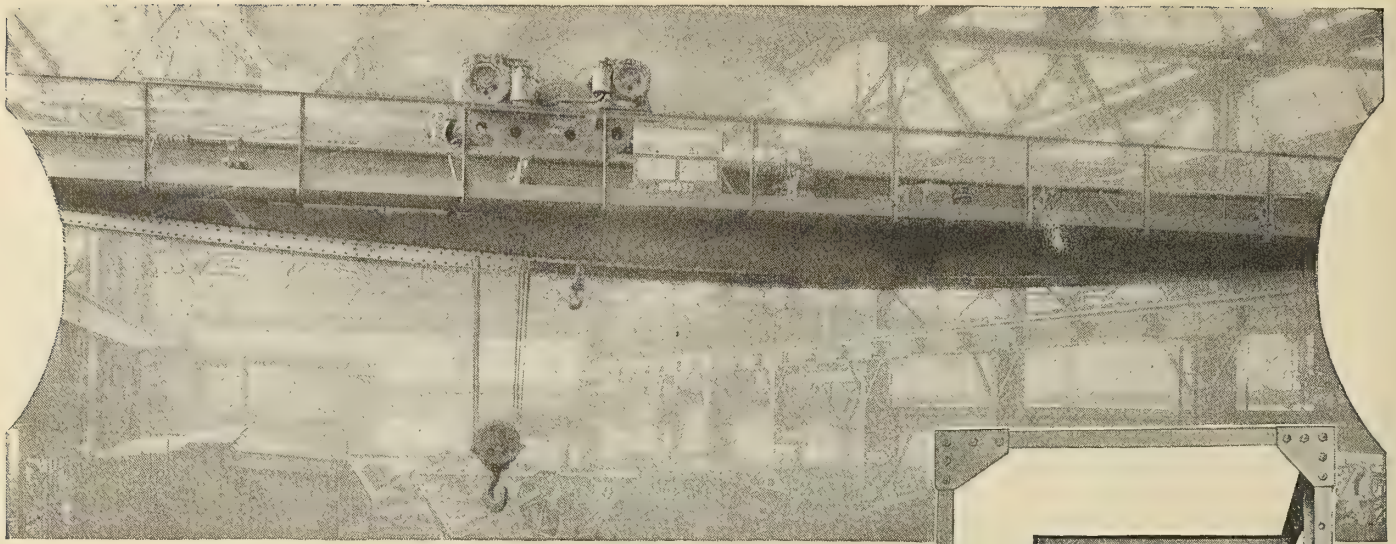
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The P & H Co. have again come to the front with an important improvement for the benefit of crane users. Accidents due to contact with live electrical parts are made well-nigh impossible.

The new cab design perfected a year ago has all electrical parts—switchboards—controllers, and wiring terminals entirely enclosed in an all-steel cabinet in rear of crane cab.

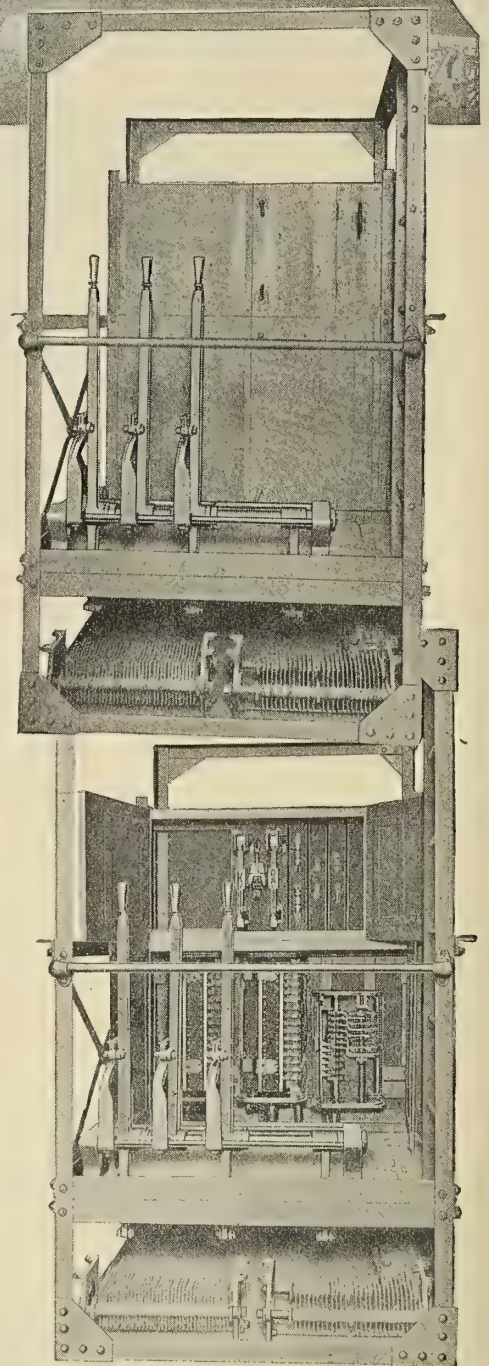
Yet all essential parts are very accessible since the opening of four doors expose all switchboard and controller parts for inspection or adjustment.

The control levers at the front, radially operated, give the crane man unobstructed view of workmen below,—of the hook in various positions, and the entire floor.

This safety cab is but another evidence of progress and the knowledge of cranes and crane applications gained through the 30 years of experience in crane design and construction, coupled with P & H engineering talent.

The levers are at the front. Everything else is entirely enclosed.

P & H Orderliness is apparent upon opening the four doors of the steel enclosing cabinet.



Crane and Hoist Division

PAWLING & HARNISCHFEGER CO.

In Milwaukee, Wis., Since 1884

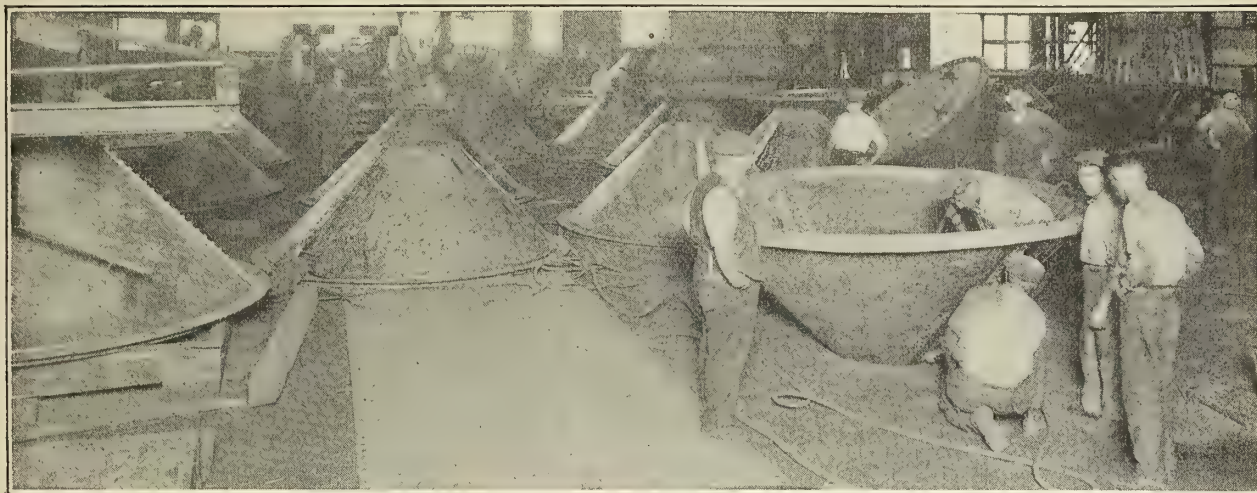
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We have been building steel ships ever since they were first produced in this country. For 62 years our Chester Yard has been known for the excellent performance of its ships.

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Designs ready for Tankers of 10,000 D. W. T. All kinds of ships up to 15,000 D. W. T. Motorships 11,500 D. W. T. with Diesel Engines. Conversion of Steamships to Diesel Motorships with Direct or Electric Drive. Repairs and Reconditioning of Ships.

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All kinds of Joiner and Cabinet Work.

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Ferguson-Herbert Plant
is equipped for
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If it is a case of grinding, beveling, cutting, slotting or milling, heavy shafting, rudder parts, propeller blades, hubs as well as smaller pieces—we have the facilities for turning out quality work in record time.

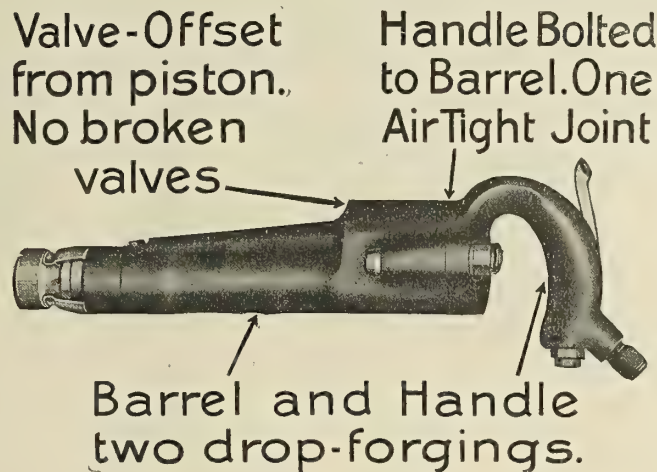
Essentially our Foundry Plant is exceptionally well equipped to make bronze, semi-steel or gray iron castings, grate bars, bridge walls, hawse pipe and any of the thousand and one pieces that are used aboard ship or in general construction work. Almost all Port Engineers and many Hydraulic Engineers know Ferguson—and the reputation the name carries.

Let us tell *you* more of our service and plant facilities.

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These Hammers Will Cut Your Maintenance Costs in Half



"Little David" Riveters

They have eliminated ordinary hammer troubles through their special features of construction.

The valve is offset from the piston bore and cannot possibly be injured by the piston.

The handle is attached to the barrel by two alloy steel bolts. There are no threaded joints to work loose and leak.

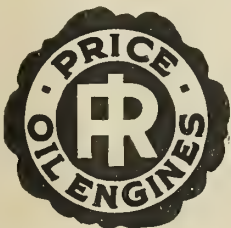
The handle and barrel are made from two solid drop forgings of great strength.

These features will reduce your riveting costs.

There are also "Little David" Air Drills, Grinders, Chipping Hammers, Core Breakers, Hoists and Sand Rammers for every Requirement.

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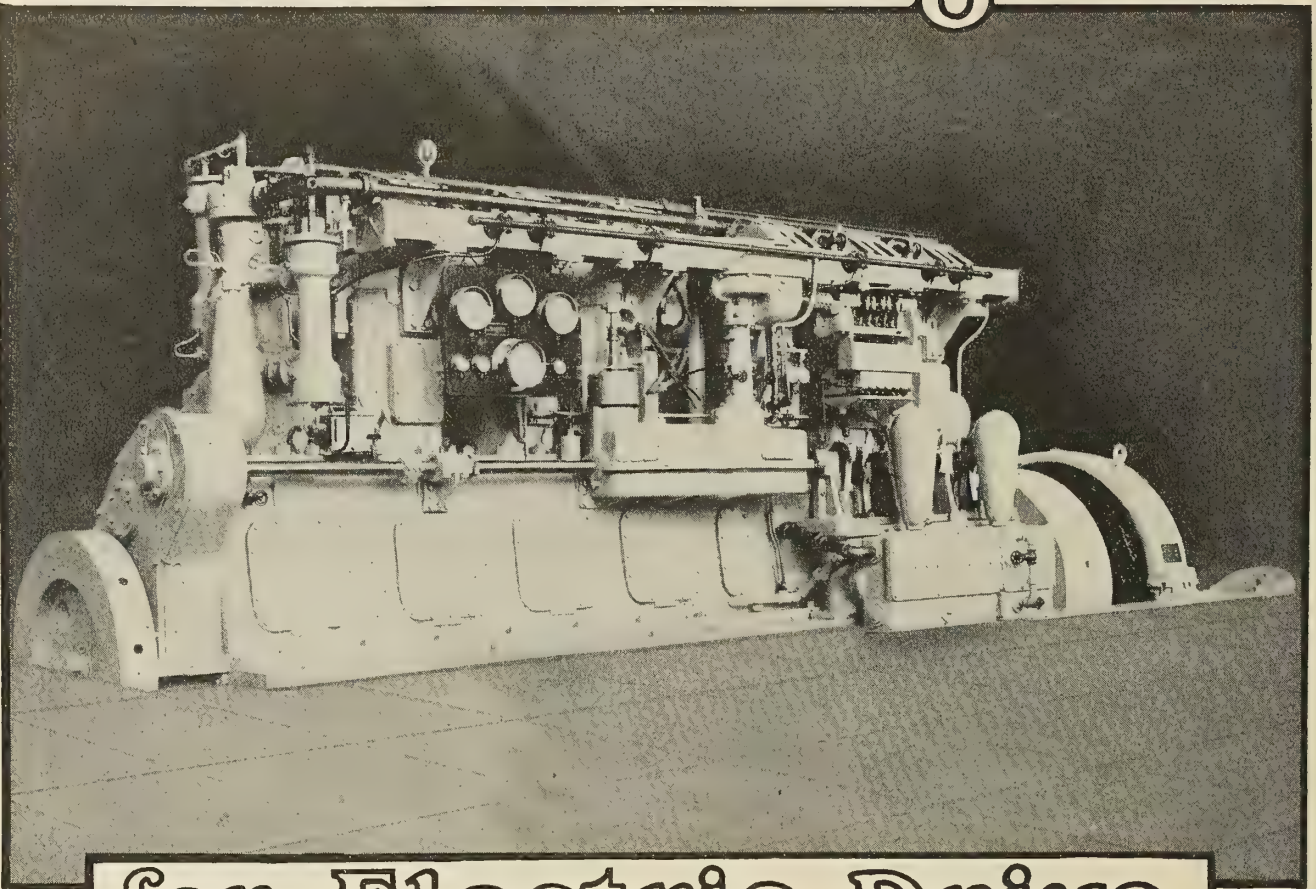
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describes
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Winton Oil Engines



for Electric Drive

AN increasingly large number of Winton Diesel-Electric Drive Installations are being made, because these outfits are proving out in service to be splendidly efficient and extremely economical in operation.

A series of two or more Winton Oil Engines, each connected to a Westinghouse Generator, generating power and supplying it to a driving motor located in the stern, makes an ideal installation for many different types of ships. The power plant can be placed advantageously, it occupies less room than any other type of propulsion unit and requires a minimum of attention and labor. Its fuel is low in cost, easily stored and quickly taken aboard.

Write to-day for full details of Winton Diesel-Electric Drive Units and for the new Winton Catalog

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Winton

Weight—A Large Factor in Ship Operation

Marine boiler weights are now receiving serious consideration, especially in passenger or freight ships requiring large power. Formerly the excessive weight of Scotch boilers was thought necessary to assure reliable operation. The modern demand for fuel economy, however, requires higher steam pressures and temperatures, with lower boiler weights. This caused the introduction of water-tube boilers in naval vessels. Practically all naval boilers are now of the water tube type and the merchant marine is rapidly following successful naval practice.

Even in moderate-powered cargo ships the weight of boilers is a large factor in ship operation. A typical cargo ship of 10,000 tons and 3,000 S.H.P. requires three boilers. With Scotch boilers and their necessary auxil-

iary equipment, such as forced draft fans, air heater and auxiliary foundations, the boiler weights will be approximately 300 tons. Similar sized water-tube boilers complete will weigh 165 tons, a net saving of 135 tons cargo carrying capacity. The increased weight of fuel necessary with Scotch boilers is also a considerable factor on long voyages.

Foster Marine Boilers are designed with careful consideration to weights of pressure parts, casing insulation and water storage necessary for steady steaming. The weights of all steel parts are amply heavy to last the life of the ship without reduction in pressure due to wear.

The Foster boiler weights are carefully analyzed in our catalogue.

FOSTER MARINE BOILER CORPORATION

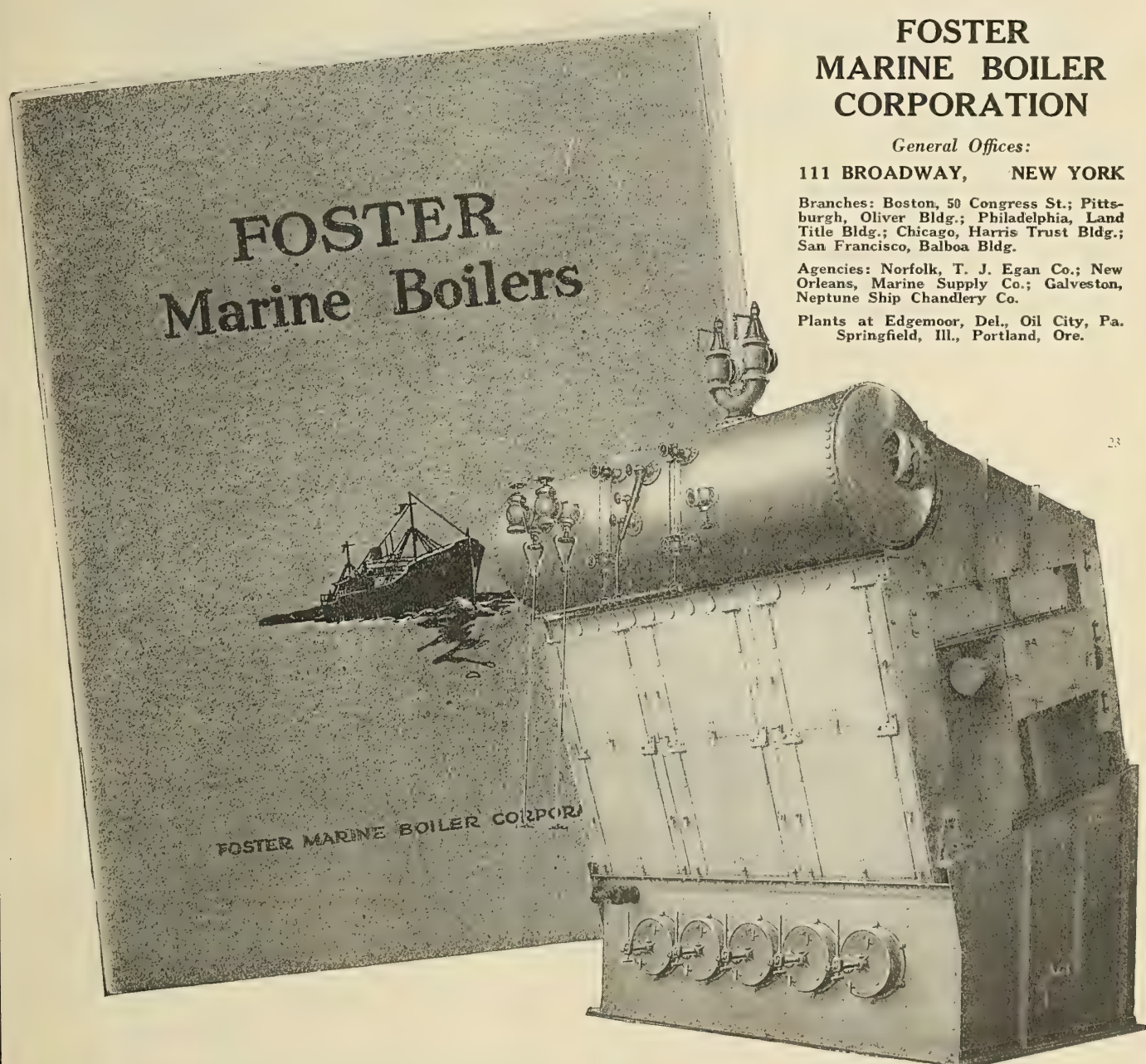
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NEARLY FOUR MILLION H.P. IN MARINE GEARS

That's the record of Falk achievement in the Marine field—a fitting testimonial to the efficiency, design and workmanship of Falk Herringbone Marine Reduction Gear Units.

This huge aggregate would never have been reached had the Falk product ever faltered or ever failed to give superior mechanical service.

Our Engineering Department enjoys the reputation of being the best in the country for consultation on Marine gearing problems.

You are cordially invited to make use of this service.

The Falk Corporation

Successor to

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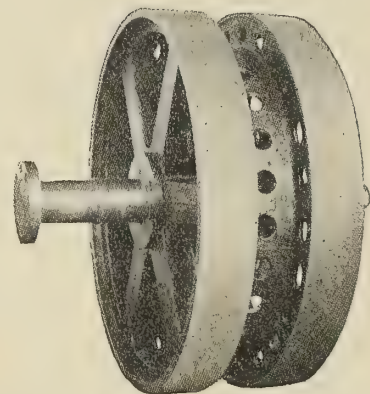
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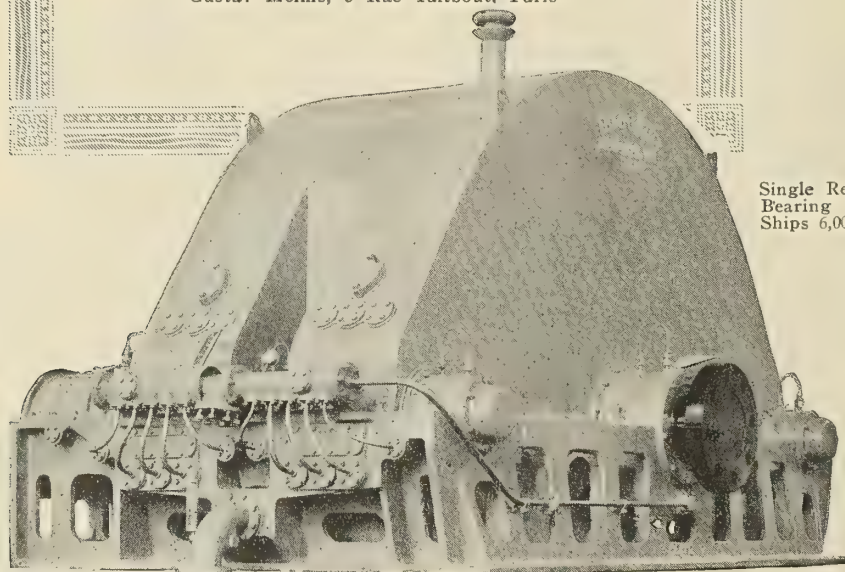
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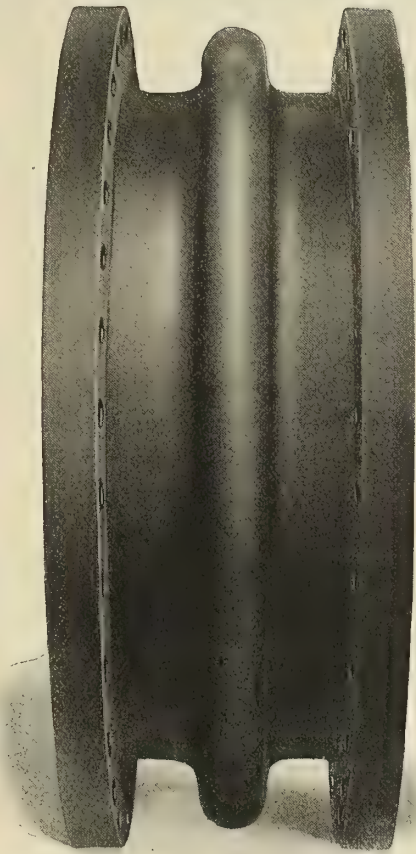
Main Gear Single Reduction Double Turbine Twin Screw Drive for Passenger Ships. 12 feet diameter. Hobbed from solid blanks cast in our own foundry in which we also produce acid open hearth steel castings for all purposes—from 1 to 100,000 lbs.



Single Reduction Gear Unit with Thrust Bearing from Twin Screw Passenger Ships 6,000 S. H. P., 1,800 to 125 R. P. M.



A New 'Wrinkle' In— Expansion Joints



The New G-R Expansion Joint

An Engineering Discovery

A process has at last been discovered which produces a very deep corrugation with unvarying thickness of metal.

ADVANTAGES

1. A really flexible corrugation.
2. Sides of this deep corrugation actually parallel planes.
3. Patented machine process—no uncertain hand forging.
4. Process removes the possibility of thin spots in the copper wall—this means thinner sheet copper can be used with perfect safety, thus insuring greater flexibility.

Send for Form Sheet No. 176.



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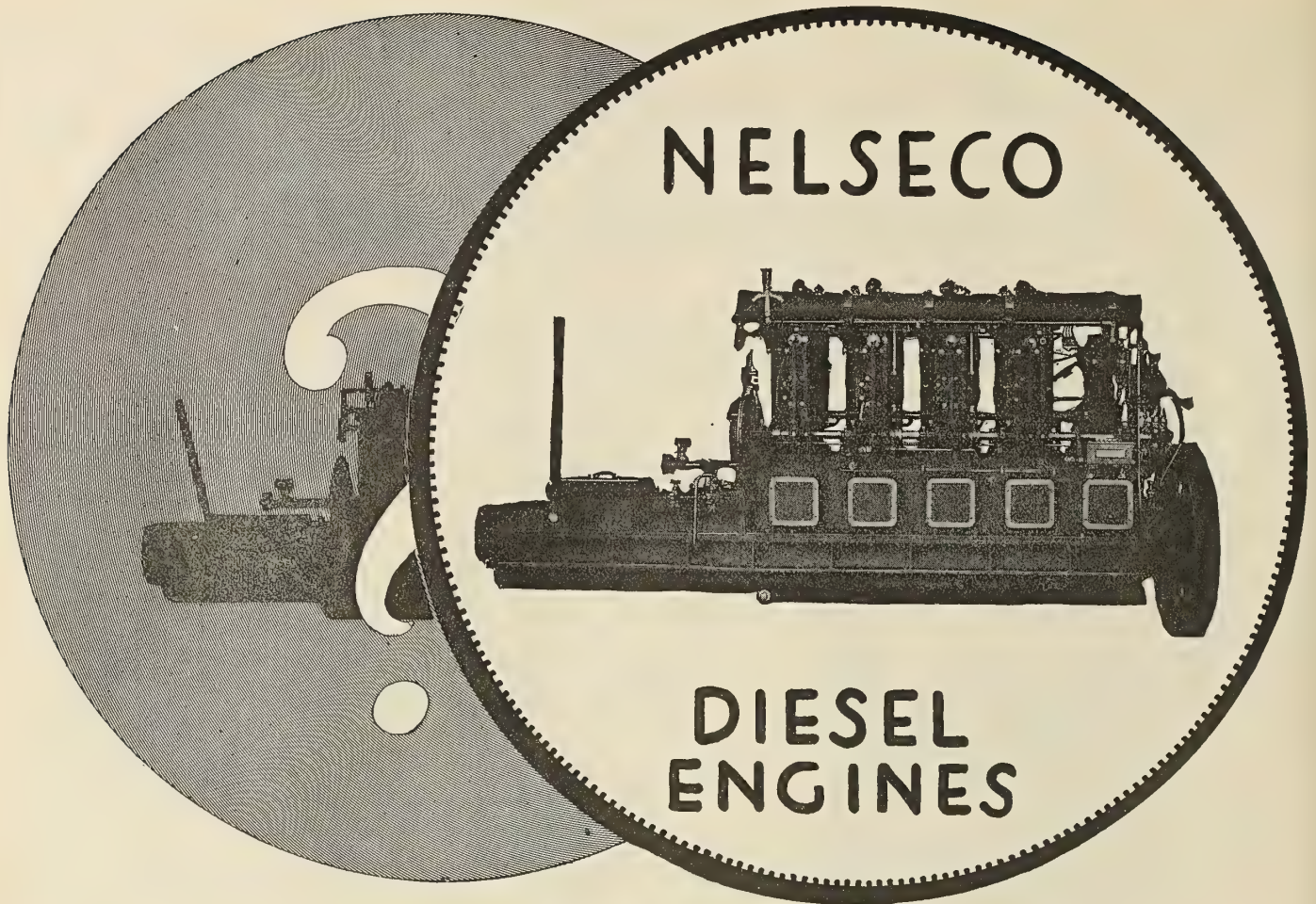
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NEVER ENTERS THE MIND OF USERS
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Ships thus equipped are propelled efficiently and dependably with as low fuel consumption as is possible to secure through any like operation. Over 150,000 H. P. now in service in American and Foreign Vessels or on order.

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"Our shipbuilding program during the war was an emergency program. *We had to build ships in yards and under conditions that made them not available for a future merchant marine.*

"I think that *these ships should be realized upon* at any price we can get within reason from private operators so far as they can make them of some value."



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A Recommendation—

Many of the emergency fleet ships can be made *commercially competitive.*

The uneconomical drives which were unavoidably installed to meet the call for more ships, can be changed to Diesel Electric—the *only drive that can be fitted in the present hulls at reasonable alteration cost.*

Diesel Electric Drive lowers labor cost, reduces time in port, provides greater cargo space and effects a saving in fuel consumption of at least fifty (50%) per cent.

Westinghouse

EVERY Ship Owner wants propelling machinery in his craft which commands his implicit confidence from the manufacturing plant to the ends of the earth



Just a section of Turbine Shop at G-E Erie Works.

One corner of Turbine Shop at G-E Lynn Works.

Shop No. 60 Schenectady; Biggest turbine plant in the world.

G-E Marine Turbines Give Tremendous Service

EVER since the turbine won its undisputed supremacy over the reciprocating engine in utilizing steam's force, the General Electric Company has been making turbines extensively for many uses.

The General Electric Company is the World's Largest Producer of Steam Turbines

In the war period—April 17, 1917 to November 11, 1918 this Company shipped Marine Geared Turbines for 147 merchant ships. These sets were produced at the rate of one per day during the last month of hostilities, and today fleets of merchant ships propelled with General Electric Company's Marine Geared Turbines are plying the seven seas.

The Curtis Turbine and G-E improved, double reduction two-plane type marine gears stand as

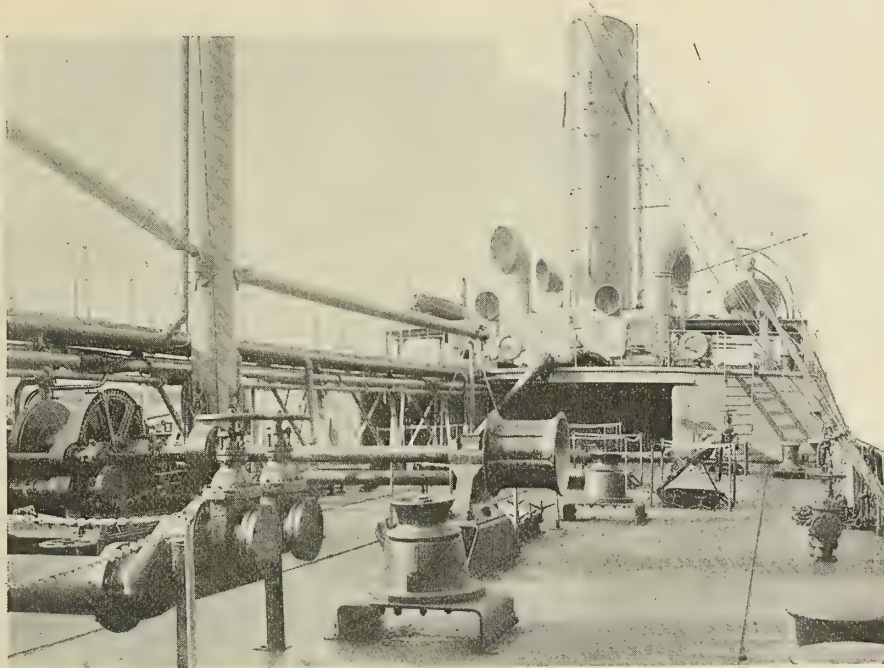
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"Save the surface and
you save all" — Paint & Varnish

Red-Lead means years to a ship

Experience proves that two or three coats of red-lead, applied to the hull on the ways, with ample time to dry, will add years to the life of a ship, and aid in maintaining speed by keeping the bottom free from pitting.

Dutch Boy Red-Lead protects metal. It provides a tough, elastic, moisture-proof coat that sticks tight and prevents rust. It won't flake or scale off, if applied to clean metal surfaces, and it gives an unequaled foundation for finishing coats.

The U. S. Navy uses a great deal of red-lead, with stiff specifications for purity —

specifications that Dutch Boy Red-Lead meets.

Its convenient paste form, its fineness and purity, its remarkable spreading power, and its long life make Dutch Boy Red-Lead the most economical paint for metal surfaces.

For every metal surface on shipboard, use Dutch Boy Red-Lead—for first coats at least. It can be tinted to black, brown, and green for finishing coats; if white or gray is desired, use Dutch Boy White-Lead.

Write for Painting Helps No. 6.

Dutch Boy Red-Lead

NATIONAL LEAD COMPANY

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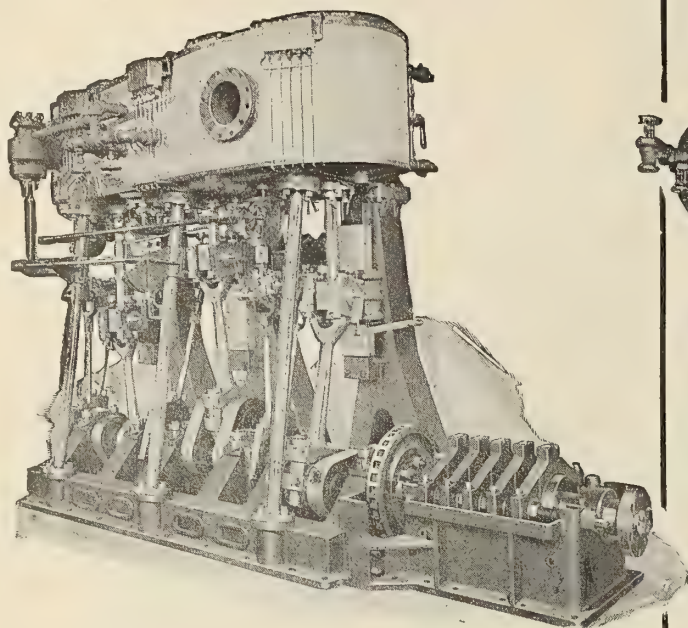
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For Perfect Balance of Your Marine Engines Consult **KEARFOTT**

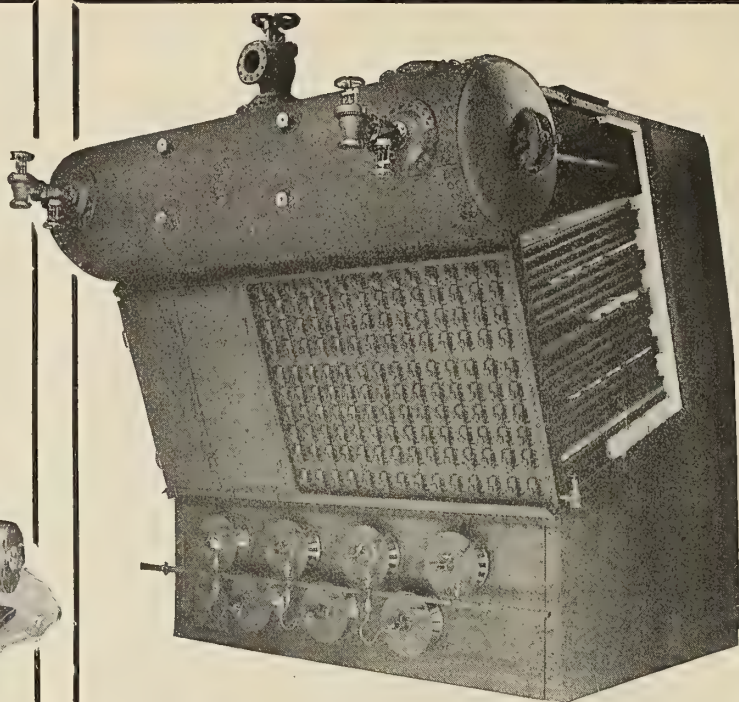
Smoothness of action and proper balance between the main and auxiliary engine units aboard ship can be satisfactorily obtained by planning according to the expert advice that Kearfott offers.

And Kearfott counsel puts you in a position to buy the exact type of high grade machinery you want to match your other unit—at factory prices.

The Kearfott Engineering Co. manufactures a full line of marine mechanical equipment from main engines to anchor chains.

Kearfott marine engineers are at your service. Put your problem up to them.

Kearfott Engineering Co., Inc.
95 Liberty Street, New York



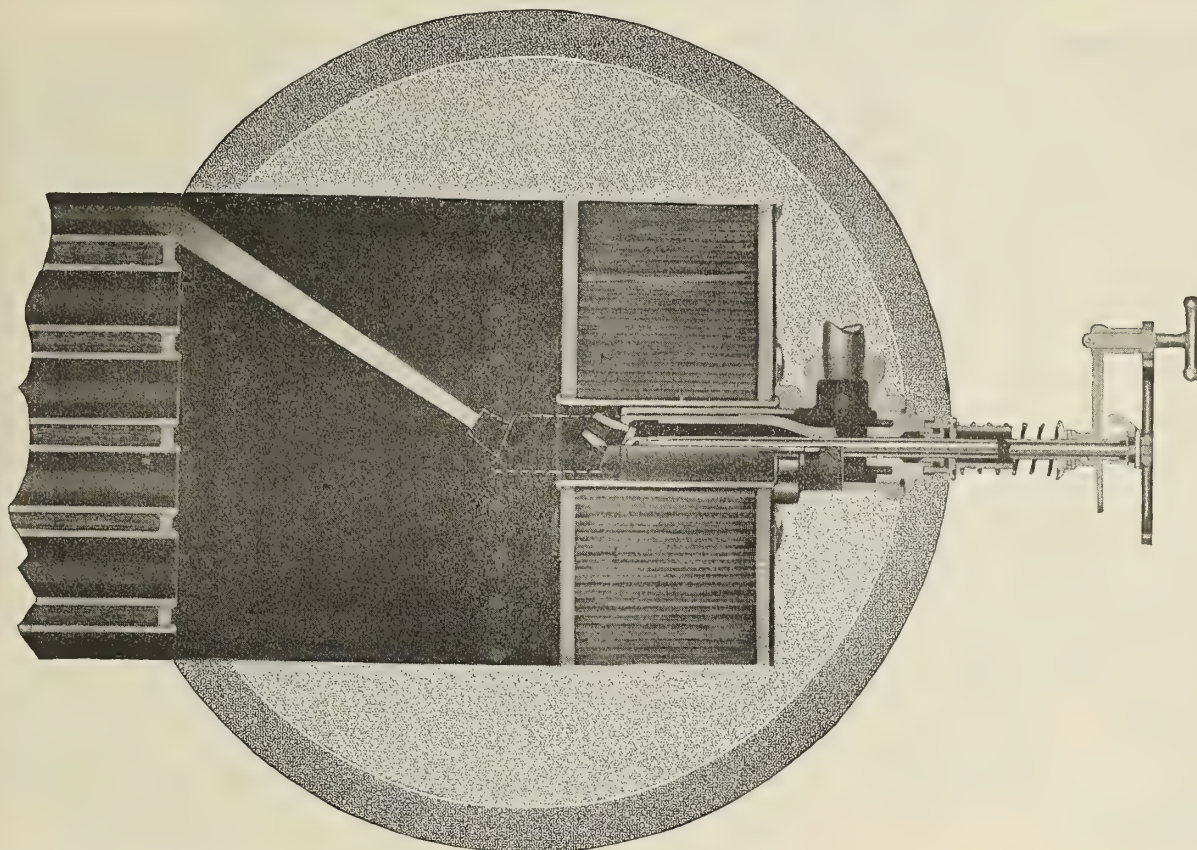
WARD Watertube Marine Boilers Command the Interest of Every Ship Owner

Ward Boilers are fitted together like an engine—headers machined for stays of I beam section—drum fitted to front header—steel tubes are straight.

No stay bolts or nipple connections—no strain—no costly repairs—and no heavy depreciation.

Ward boiler features are briefly enumerated as follows: low first and up-keep cost—positive circulation and rapid evaporation—and straight seamless tubes. You cannot do better than specify Ward Boilers. Now is the time to write for full particulars.

The Charles Ward Eng. Works
Charleston, W. Va.
Eastern Agent
Kearfott Engineering Co., Inc.
95 Liberty St. New York



SOOT REMOVAL FROM SCOTCH MARINE BOILERS

is effectively accomplished by the improved Diamond Rear End Blower (Model B).

And soot removal is essential to economy. Power is one of the largest items of expense in the cost of operating a vessel, and the cost of fuel represents on the average 70 per cent. of the cost of power. The presence of soot has cost—it still costs—a loss of hundreds of thousands of tons of coal and hundreds of thousands of barrels of fuel oil a year to ship owners. Soot waste has been eliminated on many ships, and it can be eliminated on all with a consequent notable increase in boiler efficiency and a consequent great increase in marine profits.

Thousands of Diamond Model B Blowers are in use today on Scotch Marine boiler. The blower is permanently installed through the rear water leg, a hole being cut in the plates and a section of tubing expanded and beaded into place. The blower is encased in this tubing. When not in use the blower is secreted in the casing. As the steam is turned on the nozzle is automatically forced forward into blowing position. In operation dry steam is shot into each tube with the draft at a terrific velocity, sweeping and scouring the soot from the full length of the tubes.

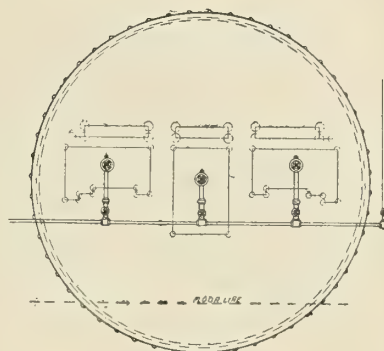
Diamond Soot Blowers save fuel and labor. Write for full information on blowers for any type of boiler, requesting your copy of Bulletin 134, "How Some Ship Owners Have Increased Their Profits."

(New York Address, 90 West St.)

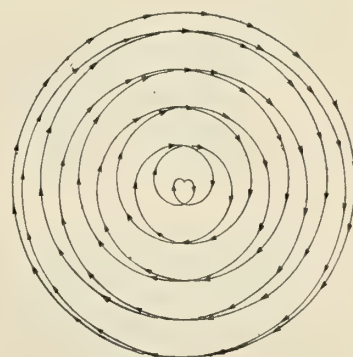
DIAMOND POWER SPECIALTY COMPANY
Detroit, Michigan

Diamond

SOOT BLOWERS - SAVE 4 to 8% FUEL

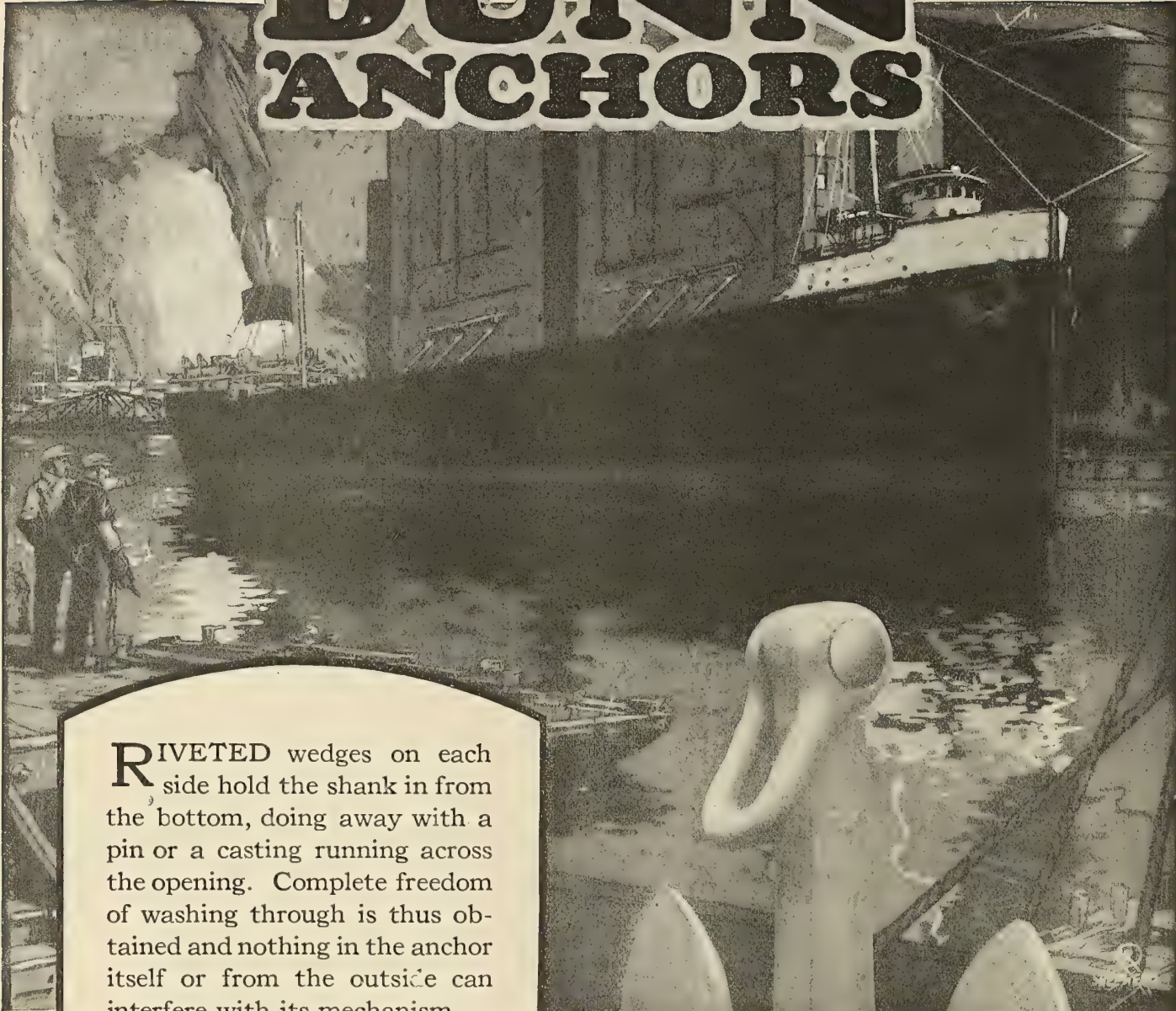


Method of installing Model B blowers on a three-furnace Scotch boiler.



The arrows show the course of the steam jet as it travels over the tube sheet, blowing every tube.

DUNN ANCHORS

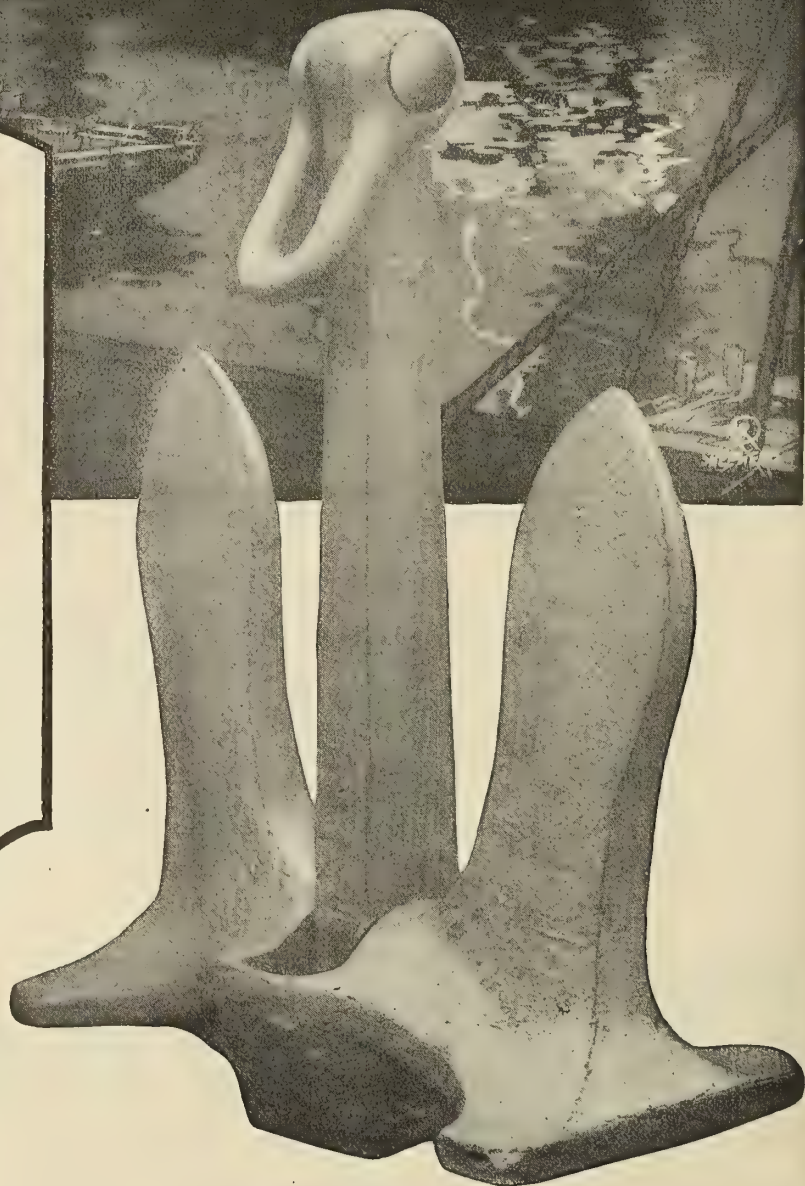
A large ship is shown in a dry dock, with its hull and upper structure visible. Two workers in hard hats and work clothes stand on the pier in the foreground, looking towards the ship. The background shows industrial structures and cranes.

RIVETED wedges on each side hold the shank in from the bottom, doing away with a pin or a casting running across the opening. Complete freedom of washing through is thus obtained and nothing in the anchor itself or from the outside can interfere with its mechanism.

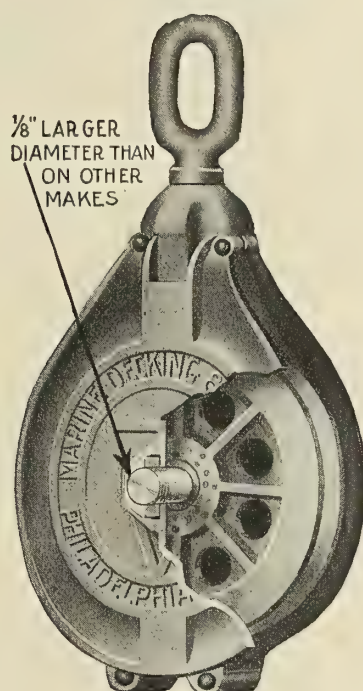
On the seas and on inland waterways, Dunn Anchors occupy a well recognized place in modern seamanship.

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Madesco Quaker

"The Cargo Hoister with that Big Pin"

OTHER FEATURES OF "THE MADESCO QUAKER" ARE:—

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For Economy— Giant Steam Hose

The extreme pressures, the high temperatures and the rough handling to which steam hose is always subjected, demands the best that can be manufactured.

Giant Steam Hose has proved the merit of its construction times without number, on steam hoists, pile drivers and in general marine service.

Our branches, located in practically all the larger ports, are prepared to supply you promptly with Giant Steam Hose, built especially to meet your requirements.

United States Rubber Company

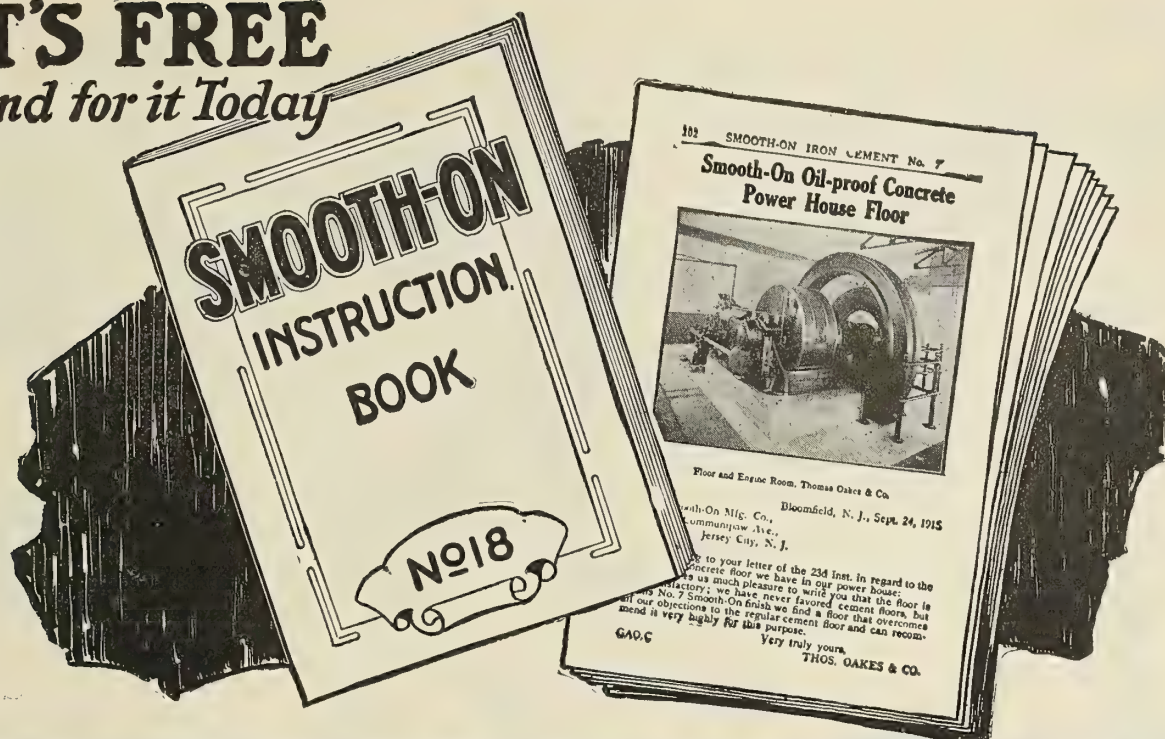
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This Book is Ready for You

It's important to keep up-to-date in Smooth-On Iron Cement Instruction Books.

The latest one is No. 18 and it contains some interesting uses for Smooth-On Iron Cement that were not included in earlier editions.

Engineers are continually finding new uses in the way of boiler, engine room and general repair work and there is every reason why you should profit by their experience.



Wet Cellars

made dry from inside by coating the walls and floor with Smooth-On Iron Cement No. 7. Illustrated instruction book sent upon request.

Send for Instruction Book No. 18 now.

You might forget if you put it off.

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Jersey City, N. J.

Gentlemen: Kindly send me a free copy of Instruction Book No. 18 as per your September advertisement in Marine Engineering.

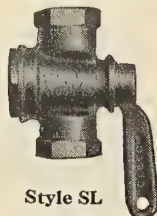
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Cleco

PRESSURE-SEATED AIR VALVES

THE VALVE THAT NEVER LEAKS



Style SL



Style FW

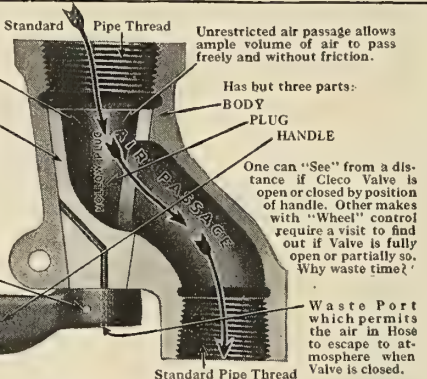


Style A

No "Packing" required. The Hollow Plug is Pressure-Seated, and by constant use automatically reseats itself.

Body and Plug are ground in position. The "taper" of Plug is carefully figured out in all sizes of Valves to allow easy turning of Handle under all pressures.

Handle is pinned on solid end of Plug. No "nut" as in the ordinary Plug Cock for men to tamper with or to get loose, allowing plug to get off seat and cause leakage.



Standard Pipe Thread

Write for Illustrated Bulletin No. 48



Style PO

There is a Cleco Valve made for every need on Air Systems, from Compressor to the Air Tool and for Hose Lines.

Multiple Outlet Valves are made in all sizes for Machines having Double-Acting Pistons and for Foundry Molding Machines.



Style LW



Style FWL

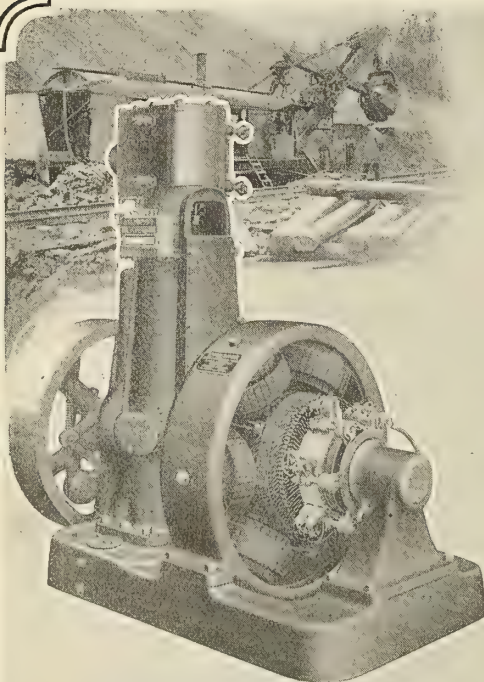


Style RA

THE CLEVELAND PNEUMATIC TOOL COMPANY, Main Office and Works CLEVELAND, OHIO

New York Boston St. Louis Chicago Philadelphia Pittsburgh San Francisco Detroit Minneapolis

CLEVELAND PNEUMATIC TOOL CO. of Canada, Limited 84 Chestnut St., Toronto, Ont. 84 Craig St. W., Montreal, Que.



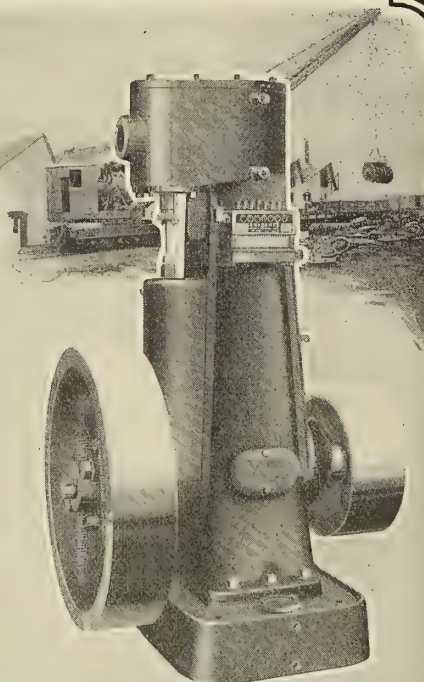
GENERATING SETS
1 TO 50 K. W.

Described in Catalog 103



Engberg Generating Sets are most economical and dependable, making them especially satisfactory for all kinds of service where continuous and satisfactory operation is desired.

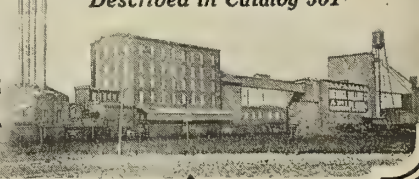
Engberg Engines are desirable for all power purposes. They combine every distinctive, discriminating and serviceable feature essential for proper performance.

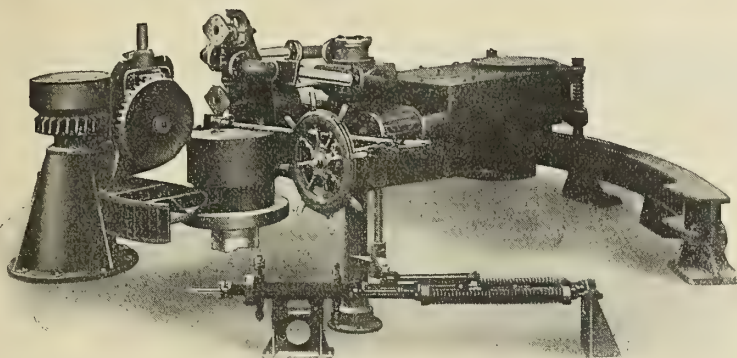


VERTICAL ENGINES
1 TO 100 H. P.

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THE BROWN TYPE STEAM TILLER AND TELEMOTOR

HIGH-GRADE MARINE AUXILIARY MACHINERY



WINDLASSES—STEERING ENGINES AND STEERING GEARS—CAPSTANS—
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WHEN ORDERING SPECIFY

“HYDE”

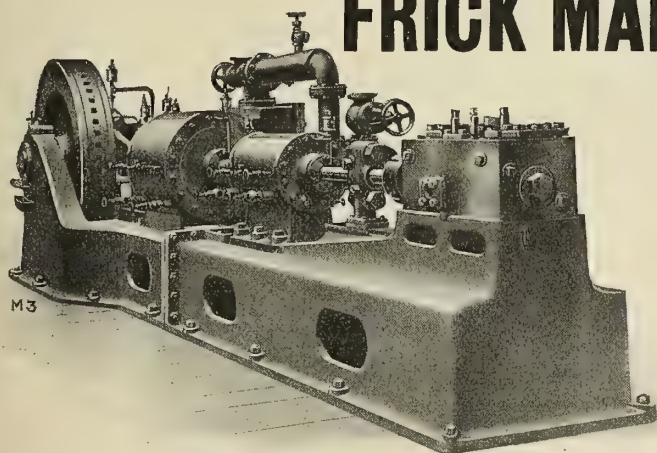
HYDE WINDLASS COMPANY, BATH, ME.

NEW YORK OFFICE, 25 WEST 43rd STREET

2



FRICK MARINE REFRIGERATION



CO₂ Compression Machine

stands for better sanitary conditions, even temperatures, improvement in the quality of the goods stored and a reduction in the amount of goods lost.

Heavily built and reliable machinery is essential in the successful operation of the modern refrigerating plant. The QUALITY, EFFICIENCY and DURABILITY of FRICK Refrigerating Machinery are never questioned.

CO₂ COMPRESSION and AMMONIA COMPRESSION Refrigerating Units in any size to meet requirements.

BRANCHES:

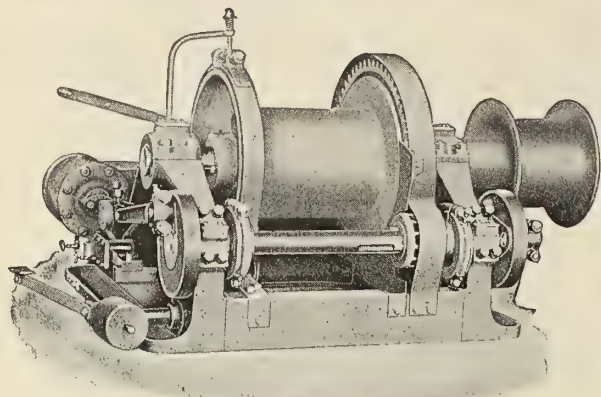
New York, N. Y. Philadelphia, Pa.
Baltimore, Md.

Frick Company
WAYNESBORO, PA., U.S.A.
ICE MACHINERY SUPERIOR SINCE 1882

DISTRIBUTORS:

New Orleans, La. Philadelphia, Pa.
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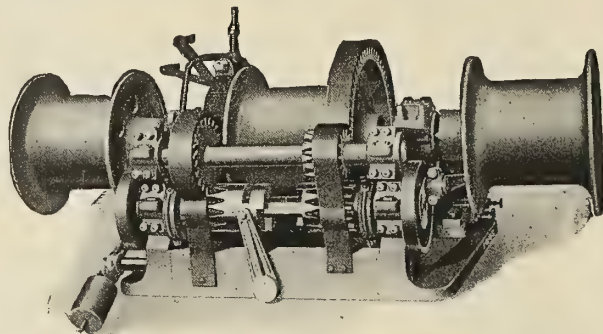
LIDGERWOOD STANDARD WINCHES



Lidgerwood Catalog No. 1917

The combination of high speed No. 1917 with compound geared two speed No. 1917C will handle any cargo at maximum speed, with minimum deck space and least weight on deck.

The successful outcome of forty-eight years building ships' winches.



Lidgerwood Catalog No. 1917C

Steam and Electric Winches—Steering Engines—Towing Engines

LIDGERWOOD MFG. CO., 96 Liberty Street, New York

Philadelphia Pittsburgh Chicago Detroit Seattle Los Angeles Cleveland Charleston, W. Va. London, England



SIZES OF DRYDOCKS DESIGNED, BUILT AND IN OPERATION

150. TONS
1250. "
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WILLIAM T. DONNELLY,
CONSULTING ENGINEER,
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DRY DOCKS RECENTLY DESIGNED AND BUILT

BETHLEHEM SHIPBUILDING CORP.....	20,000, 10,000, 6,000 TONS
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SOLID SEML STEEL

Punches & Shears

Vertical open gap machines are made with capacities from $\frac{1}{2}$ " hole through $\frac{1}{2}$ " material to 6" hole through $1\frac{1}{2}$ " material and with throat depths ranging from 6" to 72". Drive may be either belt or motor.

Wall Radial Drills

Can be furnished with horizontal arm from 6' to 20' inclusive. The No. 1 Machines have a stationary wall back while the No. 3 Machines have a 6' vertical adjustment to the horizontal arm.

Plate Planers

Cleveland Machines are built in three types, the maximum distance between housings being governed by the capacity of the machine. The standard carriage is equipped with a swiveling tool holder carrying two tools, for cutting in either direction.

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In this Department we make a specialty of the manufacture of high grade punches and dies, rivet sets and other small tools used by fabricators.

Small Tool Catalogue sent on request

Sound judgment must be exercised in buying small tools and machine tools. The products themselves represent only what is visible to the eye and what is represented or misrepresented by the seller—the real criterion is the organization back of them.



Sound Ingots produce Sound Welding Wire

PAGE ARMCO Welding Rods and Electrodes start from a **SOUND INGOT** (99.87% pure iron) free from physical imperfections and of such chemical analysis that gases and other detrimental impurities are absent.

This combined with scientific rolling and drawing operations produce **SOUND WELDING MATERIAL** absolutely essential to **SOUND WELDS**.

PAGE ARMCO Welding Rods and Electrodes fulfill all requirements of the American Welding Society specifications.

Carried in stock by distributors in all industrial centers.

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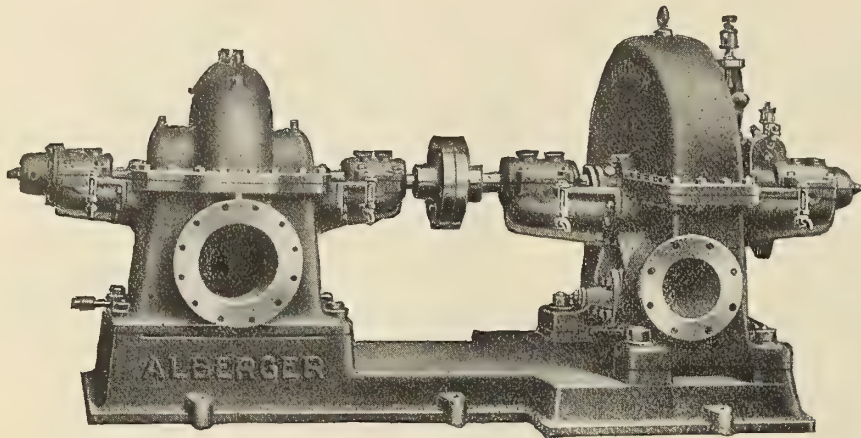
WELDING RODS and ELECTRODES



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STEAM TURBINE DRIVEN

ELECTRIC DRIVEN



Highly efficient designs in accessible patterns either steam turbine driven or electric driven for use on ships using Oil Engines have proven by continuous hard service their adaptability to marine use.

Catalog on Request

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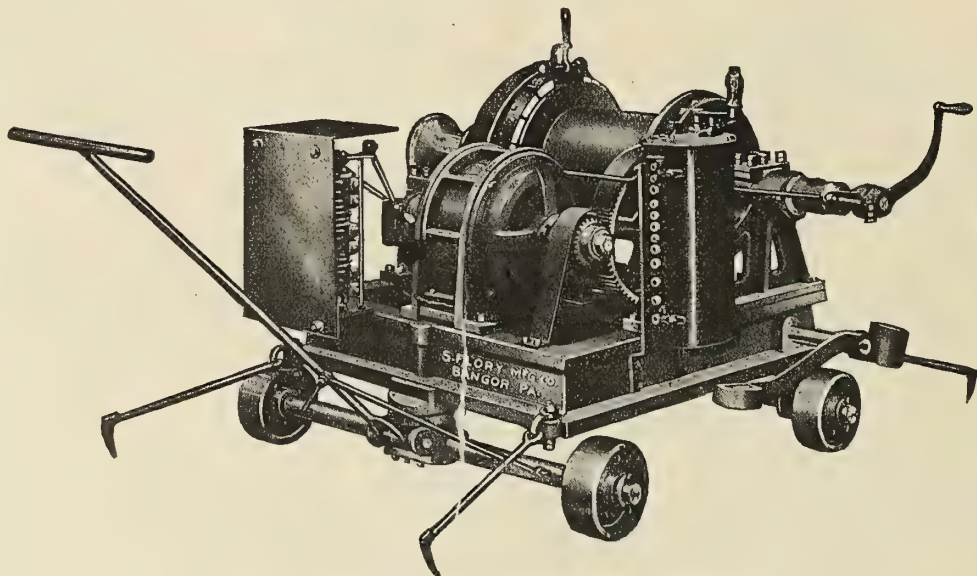
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FLORY

Flory Portable Electric Dock Winch

Fitted with d. c. or a. c. motor, 5 to 50 H. P.

A Handy Machine for Docks and Warehouses

A Flory Winch for Every Purpose

Winches, Windlasses, Capstans, Steering Engines, Marine Railway Outfits, Hoists, Cableways, Derricks

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PARKESBURG Charcoal Iron Boiler Tubes

Two Kinds Of Boiler Tubes

Boiler tubes are of two kinds; knobbled charcoal iron tubes and others.

For the charcoal iron tube, the manufacture of which dates back a century, superior resistance to corrosion and pitting and greater dependability are claimed and established.

A ship's boiler is no place to experiment with boiler tubes.

Millions of Parkesburg Charcoal Iron Boiler Tubes are in service today—in marine, locomotive and stationary boilers.

You can trust your ship to Parkesburg Tubes.

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THE REAL BABBITT METAL

for heavy pressure bearings, crank pins, slides and thrust bearings in all types of marine engines.

Standard in the largest shipyards.

Specified by leading naval architects and steamship owners for all bearings of Diesel type engines.

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100% of virgin
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of the highest
grades at all times.*

E. L. Post & Co., Inc.

Sole Manufacturers

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YORK MECHANICAL REFRIGERATION

The RELIABLE REFRIGERATION for every Practical Purpose on Board Ship

The governing factor in the selection of Marine Refrigerating Equipment, in most cases, is the reliability of the machine. Can it be absolutely depended upon to perform the work? An enforced shut-down of the refrigerating machine while on a voyage may mean the loss of a large portion of the ship stores, or perhaps of the cargo.

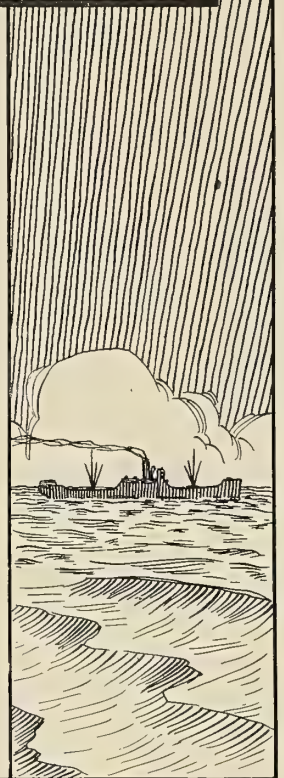
York Refrigerating Machines have demonstrated their absolute reliability by more than thirty-five years of satisfactory service, which has given them a high reputation throughout the refrigerating field.

Hundreds of vessels now plying the seven seas employ York Mechanical Refrigeration, to the satisfaction of their crews and profit of the owners. We invite all shipping interests to investigate the York Systems of Marine Refrigeration, and believe it will prove profitable to them.

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MADE OF THE HIGHEST GRADE OF

Cast Steel

Some of the largest shipbuilding companies in the United States are specifying

Powell Cast Steel Valves

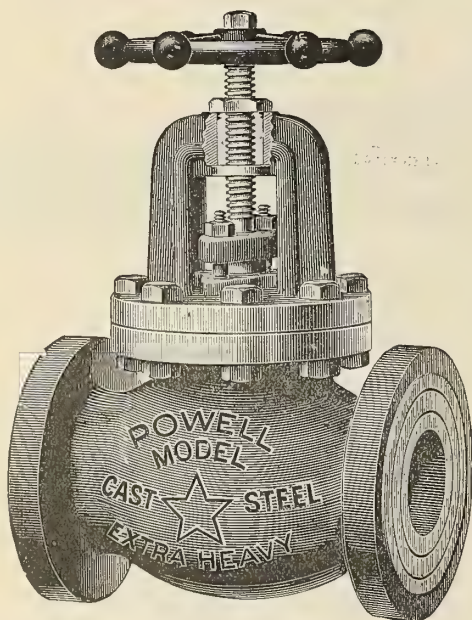
They are absolutely dependable in every particular, being entirely free from porous defects. All valves are given a thorough tensile strength and hydrostatic pressure test before shipments are made.

Specify POWELL CAST STEEL VALVES

THE WM. POWELL CO.

DEPENDABLE ENGINEERING SPECIALTIES

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Mark your message "Via RCA" to insure

**ACCURACY SPEED
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A copy of our marine radio map and a schedule of rates will be sent on request.

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Edward J. Nally, President
Dept. K, 233 Broadway, New York

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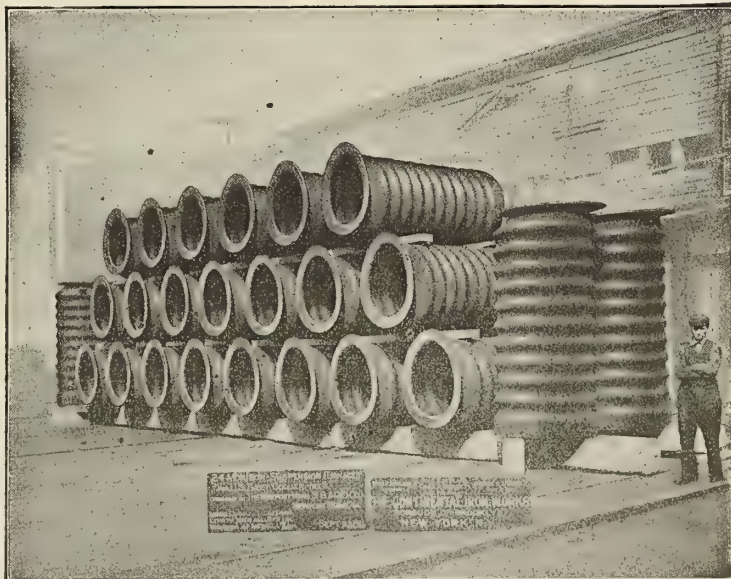
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LAND and MARINE
BOILERS



UNIFORM THICKNESS
EASILY CLEANED
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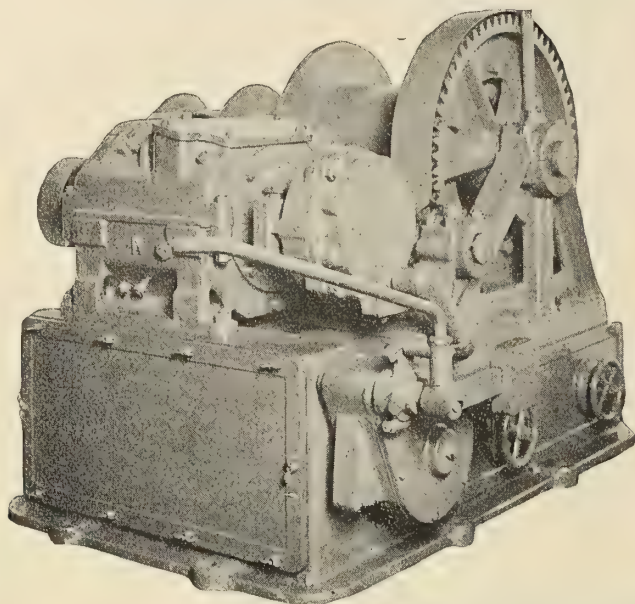
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ELECTRIC CARGO WINCH

Ruggedly built, Waterproof, Simple, Accessible, and "Fool Proof."

Largest number of Electric Winches installed on American Merchant Ships have been designed and built by **Allan Cunningham Co.** and have been demonstrated superior to all other types in speed and safety in handling cargo, economy in operation and repair costs.

The **Electric Winches** are designed and built with the same care and thoroughness as the well known **Cunningham** steam machinery and equipment.

They are not experimental but have been demonstrated as satisfactory in five years' service.

CUNNINGHAM STEAM MACHINERY AND EQUIPMENT

Have earned reputation for unequalled satisfaction in service. Early deliveries can be made of either Steam or Electric Equipment.

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SAN FRANCISCO
G. E. Swett
201 Rialto Bldg., San Francisco

New York Engineering Company

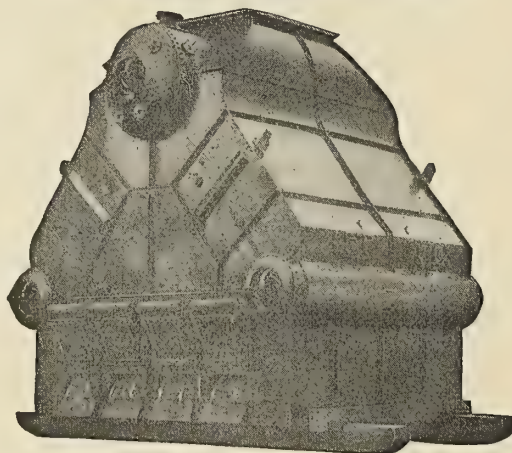
LUDLUM WATER TUBE MARINE BOILER

The New Marine Standard

A Self Contained Unit

Shipped Completely
Erected

Unequalled
Compactness



On Skids, Ready for Shipment as a Unit

All Wrought Steel

No Stay Bolted
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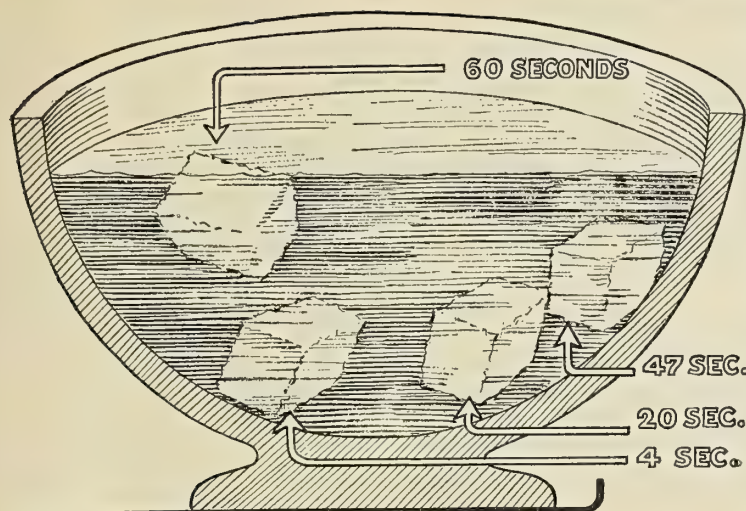
Quick deliveries assured from ample stock of material on hand.

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NEW YORK ENGINEERING COMPANY

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Works—Yonkers, N. Y.



Make This Test on YOUR Pipe and Boiler Covering

The saving effected by a pipe and boiler covering depends on a number of qualities—strength, lightness, ability to stand heat without injury, number and character of tiny air spaces, etc. If the voids holding dead air are too continuous—spongelike in character—heat will penetrate the covering quickly like water and escape.

The above drawing pictures a test made frequently and one that you can make for yourself. Four cubic-inch pieces of well known pipe covering were thrown

into a bowl of water. The 85% Magnesia cube, as will be seen, floats considerably longer than the others—60 seconds. The air spaces of 85% Magnesia are more numerous and much less continuous than those of any other known insulating material. This accounts for its remarkable insulating quality.

85% Magnesia Pipe and Boiler Covering *could* be made both heavier and stronger, if that were desirable. But it is made just heavy and strong enough for all practical purposes and this permits full insulating quality.

With the present price of coal, you should put your pipe and boiler covering to the severest practical tests. Ask us for further data on heat insulation, sent free of obligation. This Association, as such, has nothing for sale.

Magnesia Association of America

753 Bulletin Building, Philadelphia, Pa.

Executive Committee, William A. Macan, *Chairman*.



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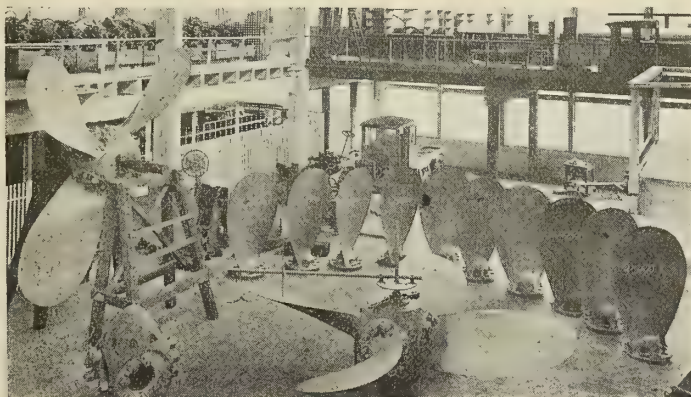
MANGANESE BRONZE PROPELLERS

SOLID AND BUILT UP WHEELS ALL SIZES

Earliest delivery, lowest quotations, accurate pitch, perfect balance. Guarantee tests. 65,000 lb. tensile strength, 30 per cent elongation.

More than one hundred large steamship propellers delivered in year ending July, 1921, for vessels of leading steamship companies and U. S. Shipping Board.

BRONZE CASTINGS ALL SIZES UP TO 40,000 LBS.



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Represented by

MARITIME ENGINEERING & SALES CORP.

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TELEPHONE RECTOR 2318

Confidence

The basis of all good business transactions is confidence — Confidence in the integrity and fairness of those you deal with.

Confidence in the things you buy—that they are as represented and will serve you faithfully and well.

Now you know why Tiebout customers come back, time after time and year after year—we enjoy their confidence, and we're proud of it.

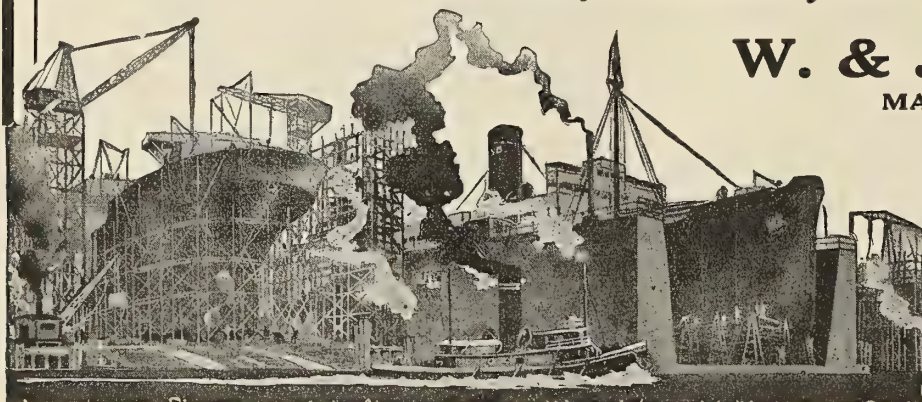
May we serve you?

W. & J. TIEBOUT
MARINE HARDWARE

Established
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1892

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CONTRACTING ENGINEERS CONSULTING

Designers of
Dry Docks

BOSTON, MASS.



SINCE 1854 we have been specializing in designing dry docks. Today more than 140 dry docks of our design are in operation—ample proof of our experience.

Our experience, our specially trained engineers, our construction methods comprise a unique service which assures economy in design and construction and certainty in results.

5000 Ton Railway Dry
Dock

Colonna Marine Rail-
way Corp., Norfolk, Va.



Photograph by U. S. Army Air Service

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

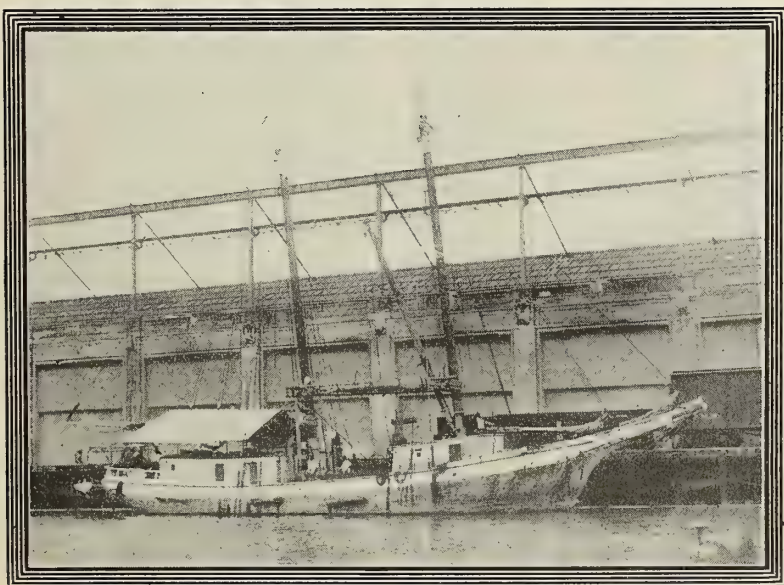
Shipbuilders and Ship Repairers

Three Large Graving Dry Docks. Steel, Brass and Iron Foundries, Heavy and Light Forgings.
Complete facilities at one plant for doing any ship repair job quickly.

Plant located at Newport News, Va., on Hampton Roads
233 Broadway, New York Newport News, Va.

Fairbanks-Morse "C-O" Marine Oil Engines

New York To Christobal in Eleven Days!



The Schooner "LAURA C. HALL."

The owners of the "Laura C. Hall" say that her "C-O" engines were always on the job regardless of weather conditions.

This schooner is 84 ft. long, 25 ft. beam, draws 10 ft. of water and has a capacity of 100 tons.

"C-O" engines, 30 H. P. to 300 H. P. use low priced fuel oils economically. They are simple and rugged—easy to start—do not require a licensed engineer.

Ask us for full details about this practical work-boat power.

Fairbanks, Morse & Co.

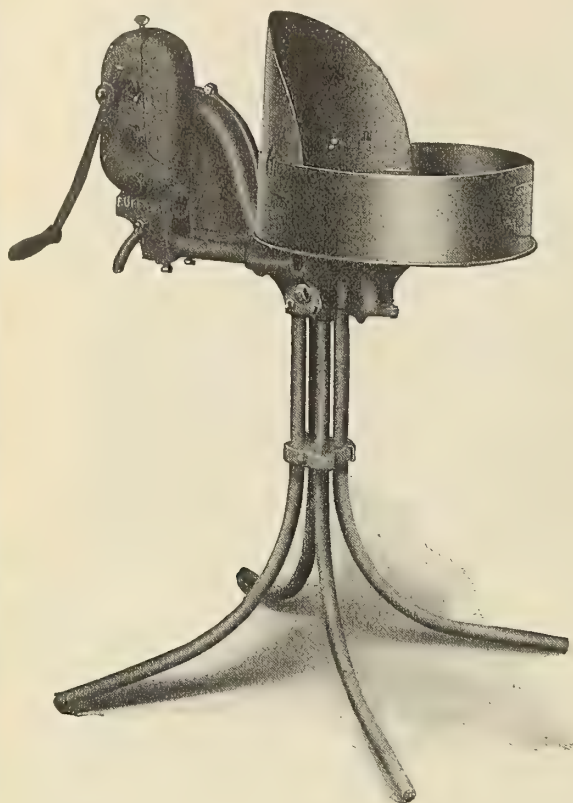
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CHICAGO

THE CANADIAN FAIRBANKS-MORSE CO., Ltd., Montreal



Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery



"Buffalo"

Forges, hand and electric blowers, drills, floor and post type, shears for cutting angles, bars and sheets, and of every size from the little bench type hand power shear to the heaviest power shear made—these are the machines you should know about.

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Buffalo Forge Company
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The R & D PARACOIL EVAPORATOR

R & D Paracoil Evaporators and Distilling Condensers are made for both single and multiple-effect plants in marine service.

Constructed with cast iron or steel plate shells, of all capacities up to 50 tons per 24 hours per unit.

Improved cleaning facilities make maintenance expense low.

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Feed Water Heaters, Feed Water Filters, Grease Extractors, Distillers, Ash Ejectors, Condensers, Fresh Water Still, Fuel Oil Heaters, Oil Coolers, R & D Gravity Flow Filters and Inspection Tanks, Rand System for Bunker Oil.

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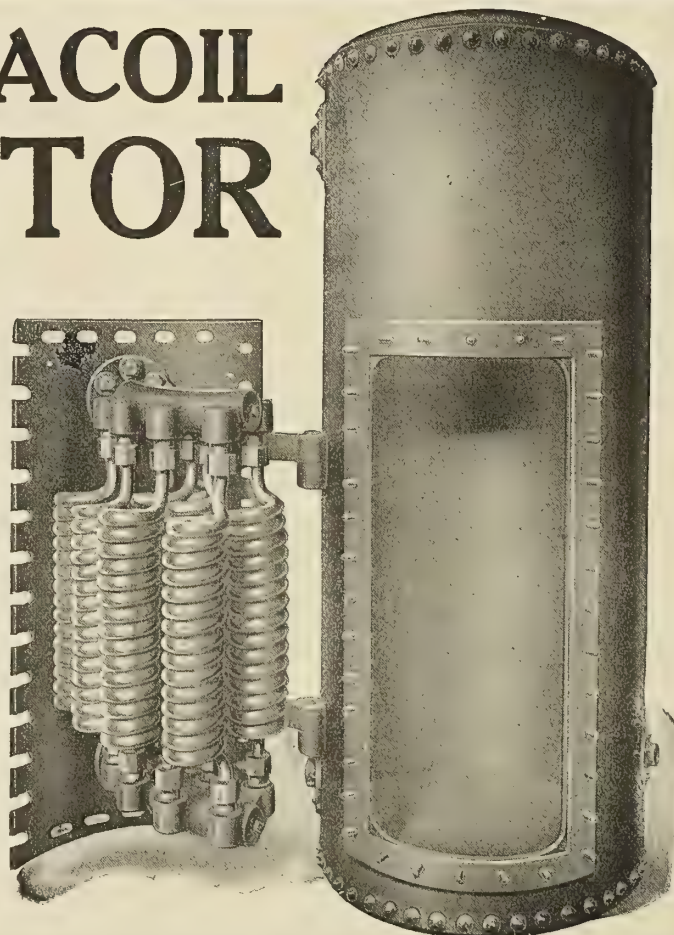
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THE SPERRY

Helm Angle Indicator

New Adaptation of Gun Fire Control Accuracy to Important Ship's Instrument

The Salient Features of this System are:

Use of highly refined SYNCHRONOUS motor of POWERFUL torque in WATER TIGHT case, insuring ACCURATE indications.

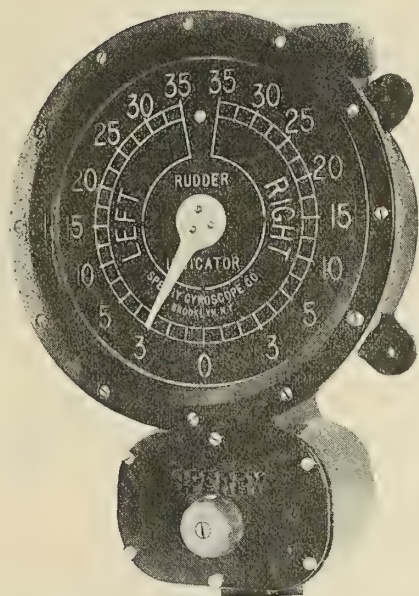
Transmitter of simple RUGGED design, in WATER TIGHT case, which is not affected by HARD USAGE.

A FINER division of indication given.

ACCURATE indications not affected by variations of voltage ordinarily experienced on ship board. Requires only 7 WIRE connection instead of the usual 12 wires.

Illuminating lamp INDEPENDENT of indicating circuit—lamp may be REMOVED for renewal while system is IN OPERATION. Illumination cut on and off as desired.

Construction of System IN FULL ACCORD with U. S. Navy Specifications as regards being ACCURATE, RELIABLE and WATERTIGHT.



Rudder or Helm Angle Indicator

THE SPERRY
GYROSCOPE CO.
MANHATTAN BRIDGE PLAZA
BROOKLYN, N.Y.

CORRUGATED BOILER FURNACES

All sizes, plain or flanged ends for
LAND and MARINE BOILERS

Made in accordance with
UNITED STATES STEAMBOAT
INSPECTION, AMERICAN BUREAU
and LLOYD'S REGISTER OF SHIPPING
BUREAU OF VERITAS
or other specifications

Seamless Forged Steel Boiler Nozzles
and

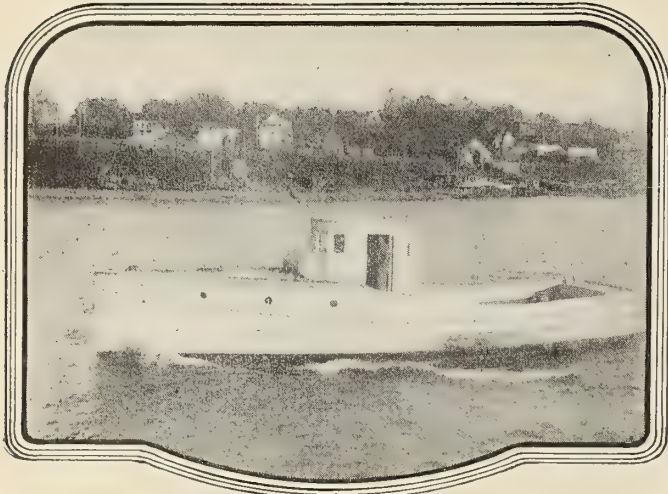
Forged Steel Pipe Flanges
in stock for prompt shipment

Lap Welded Steel Pipe
Sizes 12 to 72 inches

Manufactured by

AMERICAN SPIRAL PIPE WORKS, Chicago
NEW YORK CITY OFFICE, 50 CHURCH ST.





Columbian Bronze Propellers

DEL REY II—a Montauk Fishing Tender powered with a 32 H. P. Palmer engine, built by C. B. Butson, owned by Capt. E. V. Taber, Montauk Point, N. Y. and equipt with a 32" x 38" Columbian Bronze Propeller.

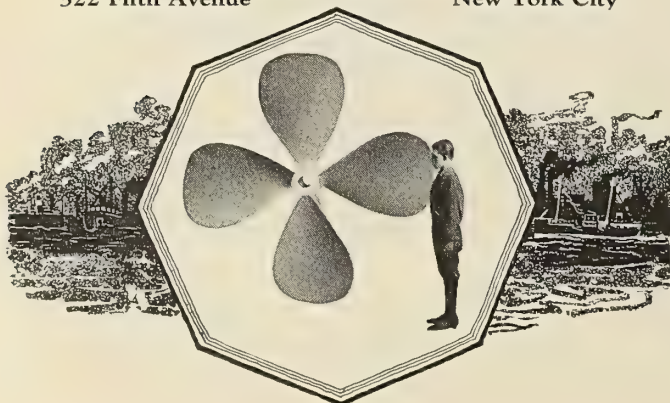
No matter whether it be a Tug Boat, a Fishing Boat, a Motorship, or just a plain, every day "work boat," consistency, speed and efficiency is what makes the difference between profit and loss.

The propeller is a mighty vital point, more losses are probably caused by poorly designed and easily broken propellers than any one cause.

Which probably explains why an increasingly large number of work boats of all sizes and types are replacing their cast iron wheels with Columbian Bronze Propellers.

*Write to-day for Columbian
Bronze Propeller Catalogue*

COLUMBIAN BRONZE CORPORATION
522 Fifth Avenue New York City



**When Time Counts
and
Strength and Perfect Fit
are needed**

reach for your

TRADE MARK
"COES"
REG. U.S. PAT. OFF.

TRADE-MARK
**KEY
MODEL**
REG. U.S. PAT. OFF.

**Four Sizes
28-36-48 and
72" Opening
to 12¼".
And they
ALWAYS
FIT.**



Made
of Steel
Forgings
thru out,
each compo-
nent is care-
fully hardened,
insuring maxi-
mum strength
and service. Your
dealer will supply
you.

MADE ONLY BY

Coes Wrench Company
WORCESTER, MASS.

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ON THE ADMIRALTY LIST.

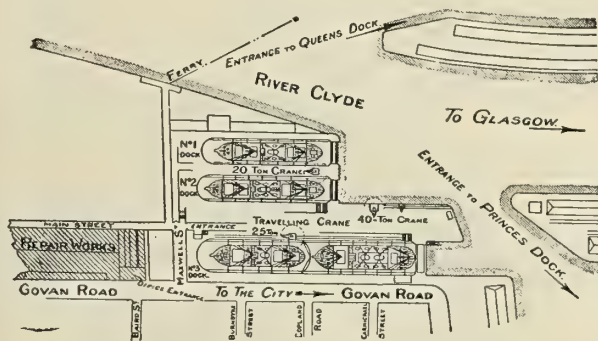
Alexander Stephen & Sons, Ltd.

Shipbuilders, Engineers Boilermakers,

GOVAN GRAVING DOCK REPAIR WORKS

**604 GOVAN ROAD
GLASGOW**

VESSELS DOCKED AND PAINTED
AND REPAIRS OF ALL KINDS EXE-
CUTED TO HULLS, MACHINERY
AND BOILERS WITH UP-TO-DATE
APPLIANCES, INCLUDING OXY-
ACETYLENE CUTTING AND ELEC-
TRIC WELDING PLANTS.



Office and Repair Works adjoin the
Largest Graving Docks on Clyde and are
conveniently situated to the Principal
Discharging, Loading and Coaling Berths,
thus ensuring Close Supervision and
Economy of Time.

Telegrams - "MIDYARD, GLASGOW."

Telephone - - GOVAN 688 (4 lines.)



NORWALK

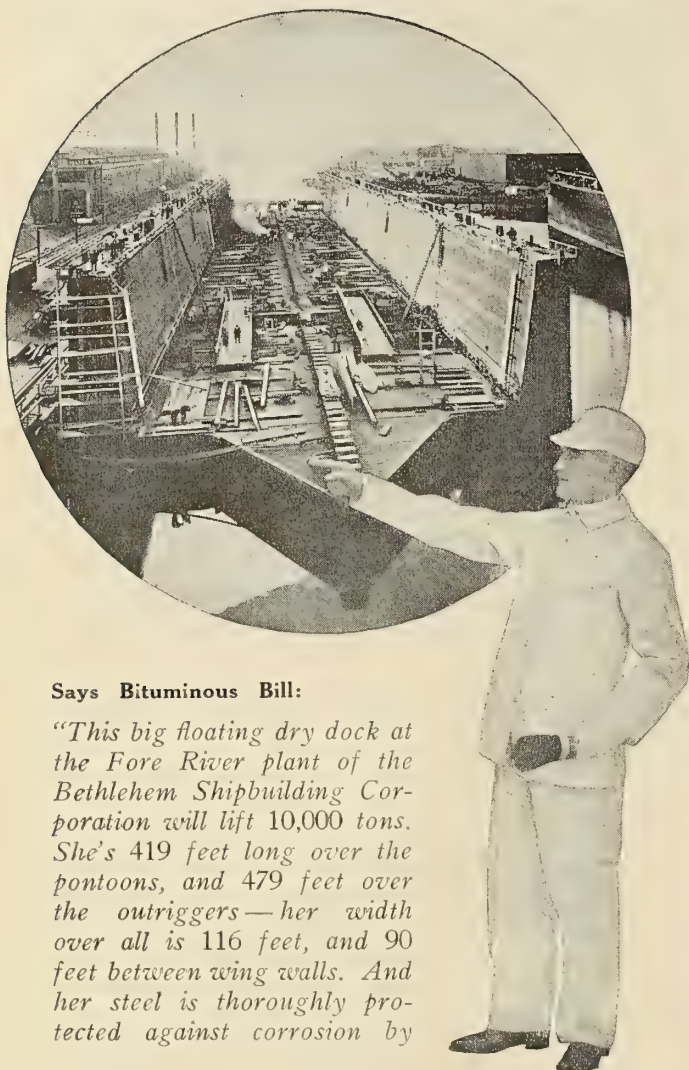
AIR & GAS COMPRESSORS

You are conscious from the
beginning that the Norwalk
is giving you a compressor
service of outstanding quality,
but it is not until after you
have had years of this same
troublefree operation that you
come to a full appreciation of
Norwalk reliability.

Illustrated Bulletins on Request

The Norwalk Iron Works Co.

*Pioneer Builders of Compressors***South Norwalk, Conn.**



Says Bituminous Bill:

"This big floating dry dock at the Fore River plant of the Bethlehem Shipbuilding Corporation will lift 10,000 tons. She's 419 feet long over the pontoons, and 479 feet over the outriggers—her width over all is 116 feet, and 90 feet between wing walls. And her steel is thoroughly protected against corrosion by

Briggs Bituminous Composition

Briggs Composition is an invaluable rust-preventative for steel vessels of all types and sizes—for floating dry docks, caissons and any other metal structure exposed to moisture and corrosion.

It is particularly effective in double bottoms, bilges and other places which are difficult of access—it is impervious to moisture, and forms a smooth, glossy coating which will not chip or flake off, and resists the destructive action of acids and alkalis.

Write for our booklet,

"The Solution of the Corrosion Problem."

Briggs Bituminous Composition Co.

Incorporated

17 Battery Place

New York City

Great Britain: Wm. Briggs & Son, Ltd., Dundee, Scotland



BITUMINOUS COATINGS

The Solution of the Corrosion Problem

BBC-32

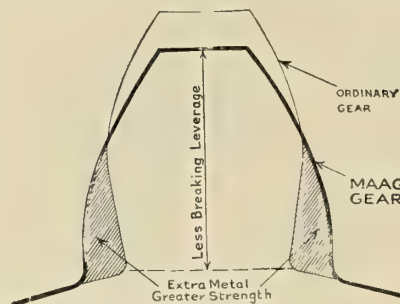
*Their teeth are stronger
at the base if they're*

**MAAG
GEARS**

COMPARE these tooth diagrams of a Maag Gear and an ordinary gear. At the base of the tooth, where other gears most often fail, Maag Gears are widest. This "strongest-at-the-base" tooth is typical of all Maag Gears—large or small—and is the fundamental reason for Maag tooth strength and Maag Gear endurance. It means the ability to carry greater loads than ordinary gears will take.

We use Maag Gears on the heaviest machine tools we build. We know they are stronger and longer wearing than any other gears we've ever tried.

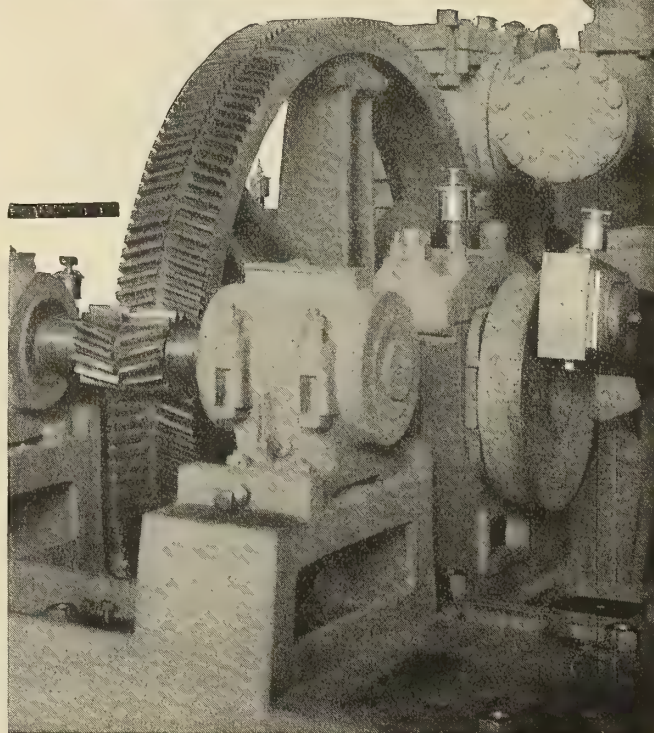
You need such gears on your mine equipment. If the machinery you buy now isn't equipped with Maag Gears, replace the first gears worn out with a Maag set and notice the better service and longer life they will give you.

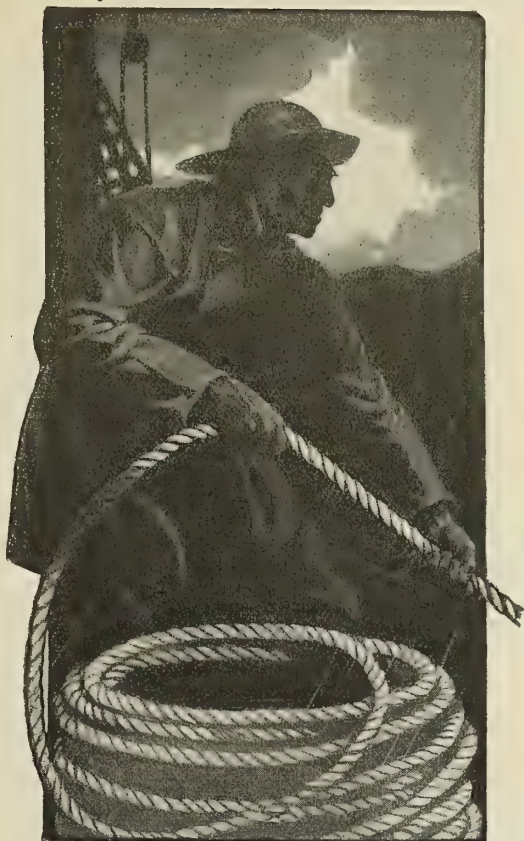


The whole story of the remarkable new gears is told in Catalog No. 265. It is worth a careful reading.

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"THE RELIABLE ROPE"

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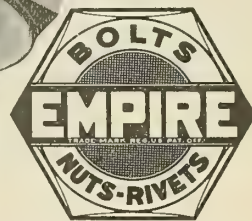
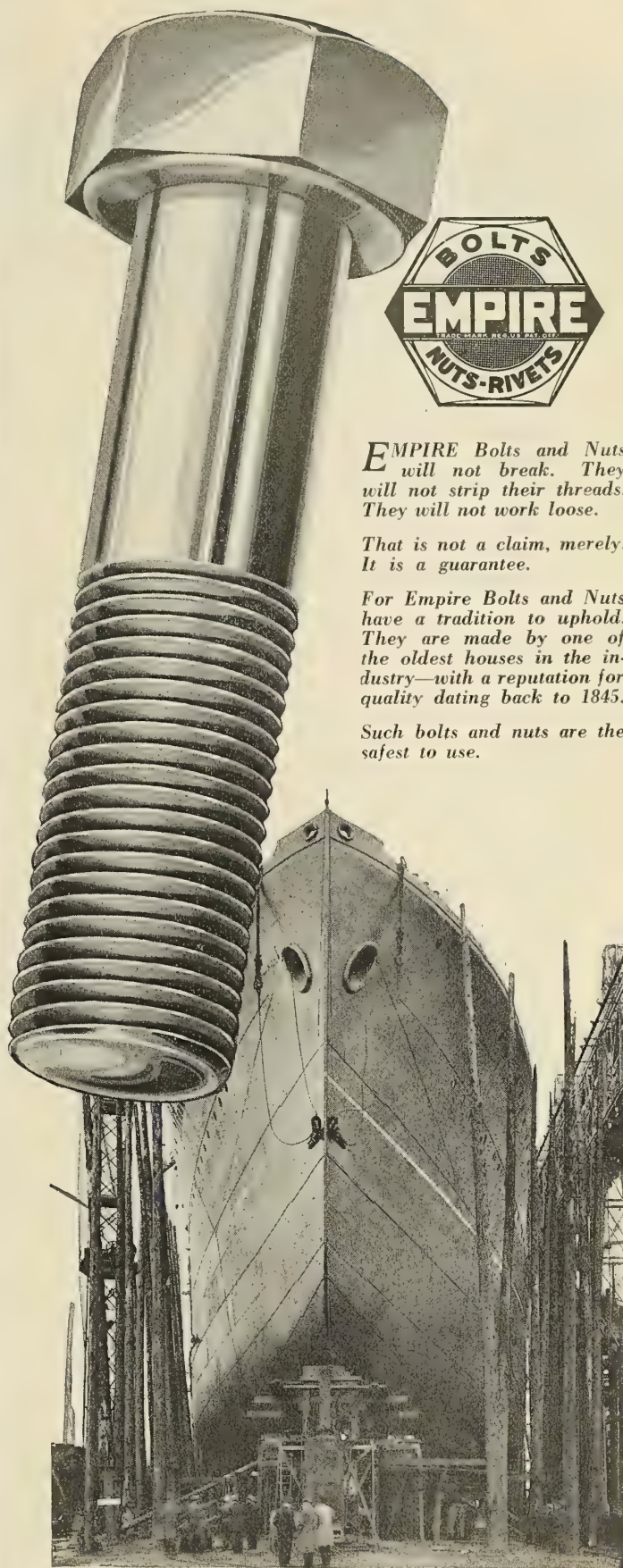
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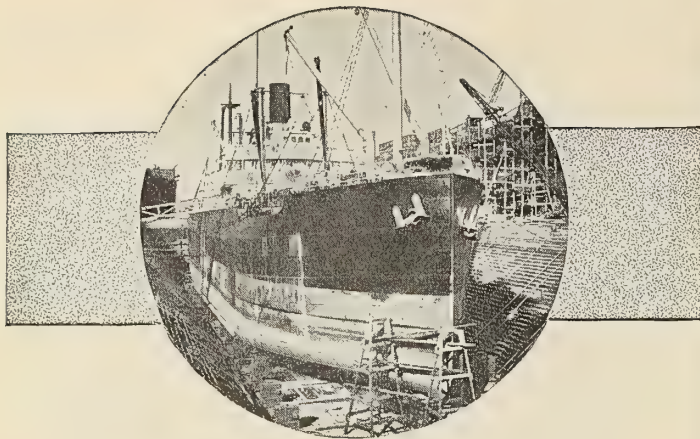
*That is not a claim, merely.
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*For Empire Bolts and Nuts
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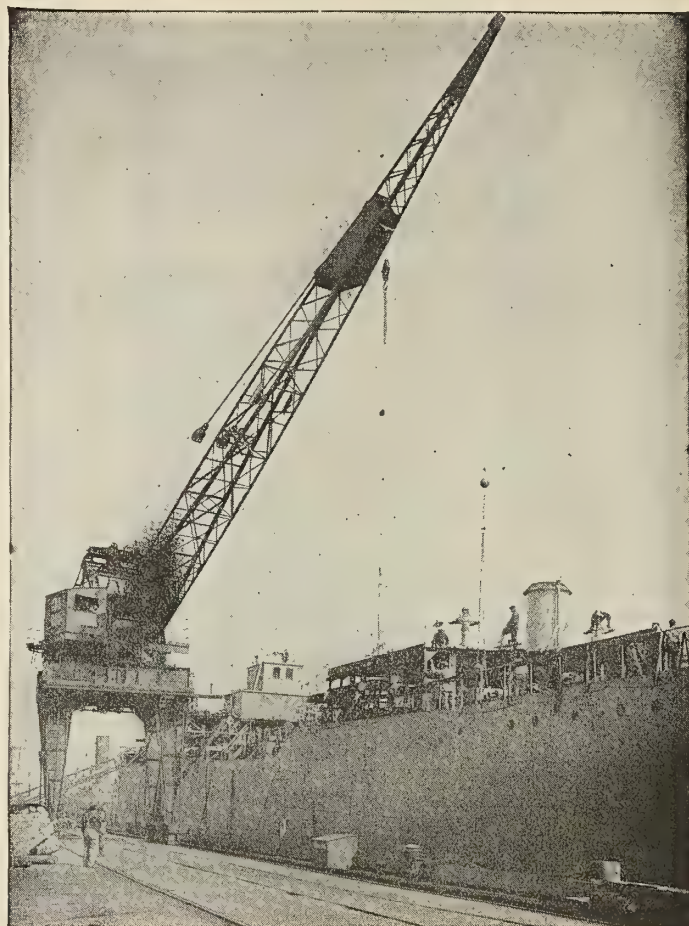
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F-22



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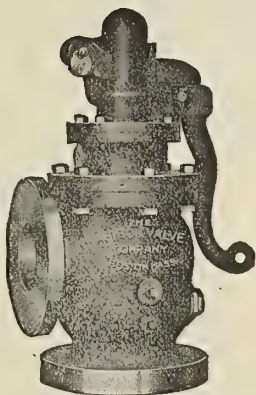
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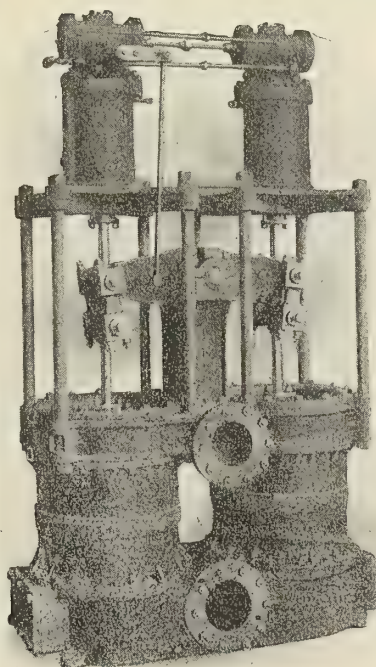
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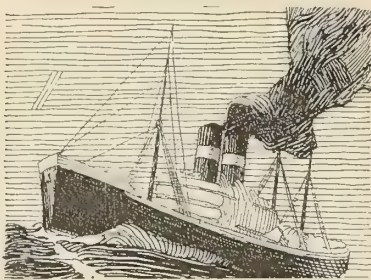
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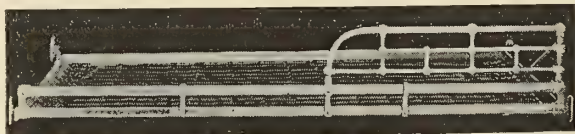
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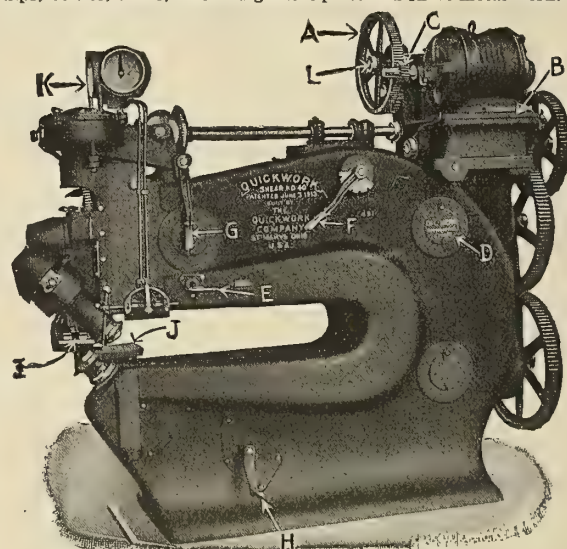
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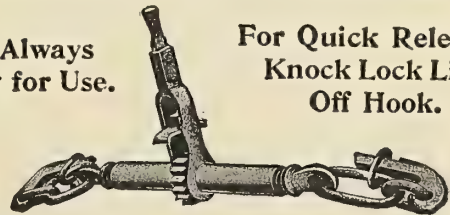
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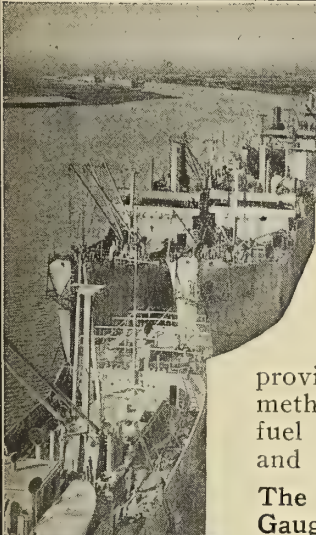


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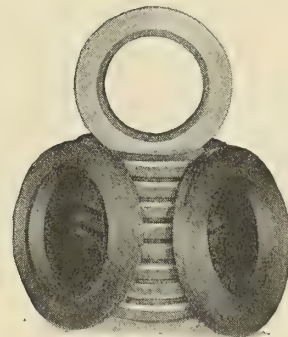
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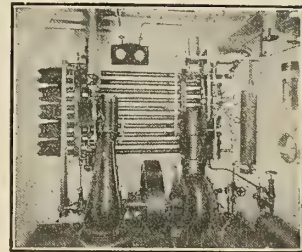
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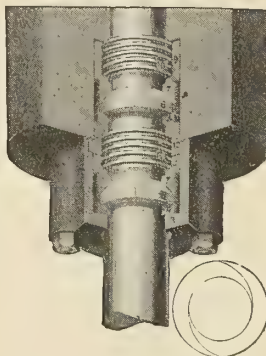
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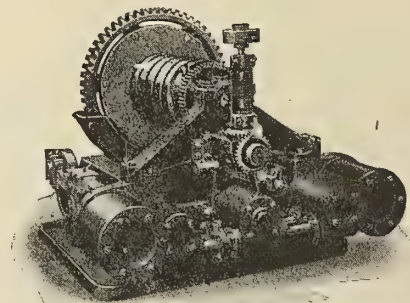
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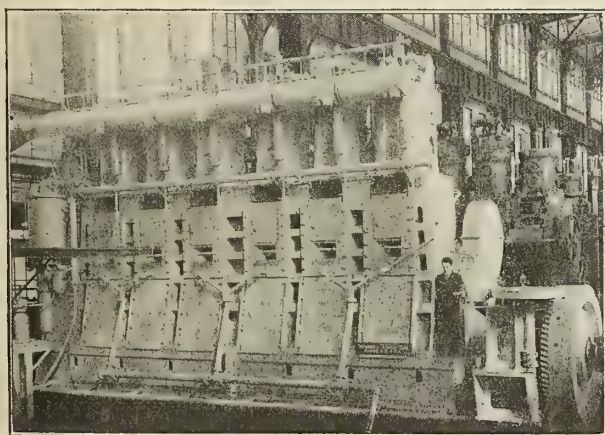
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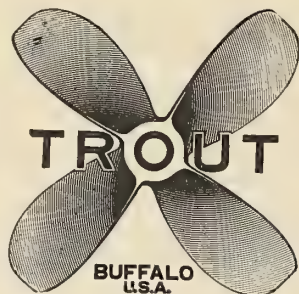
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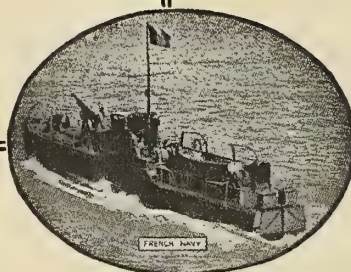
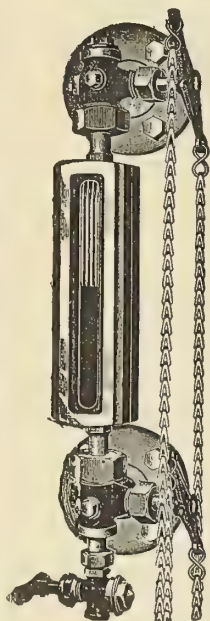
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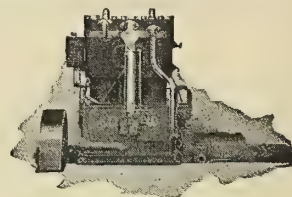


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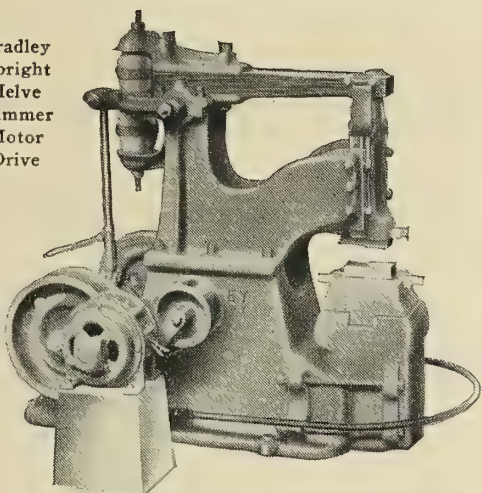
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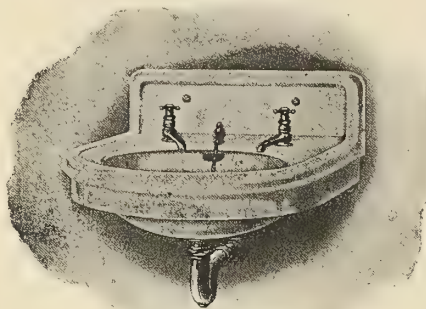


Plate S-208

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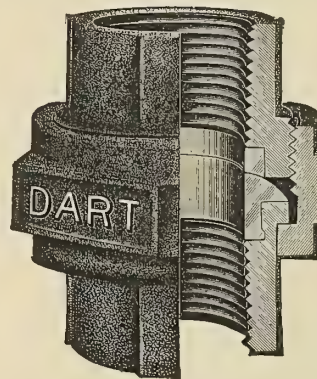
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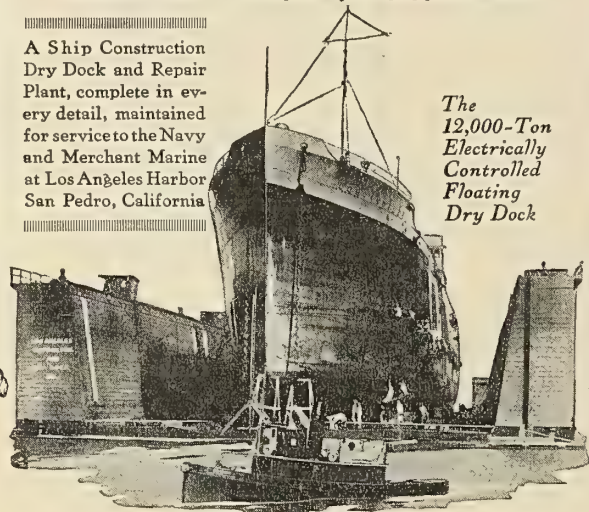
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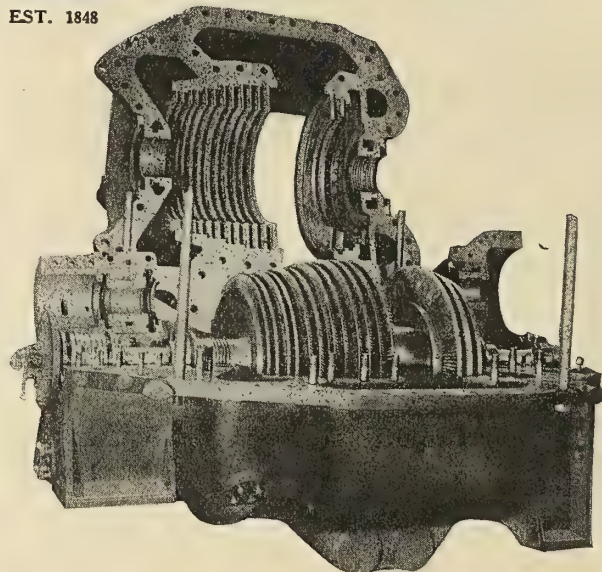
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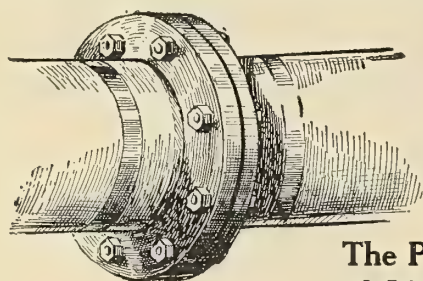
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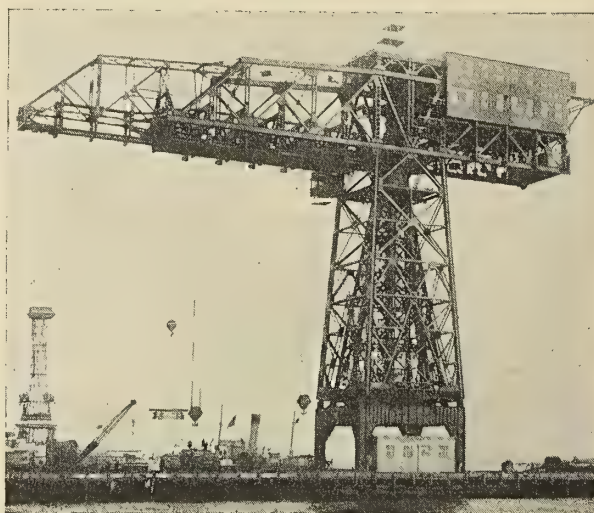
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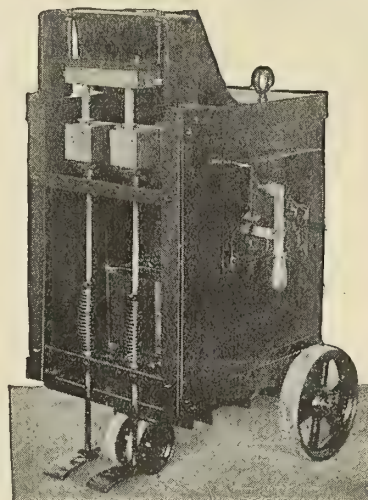
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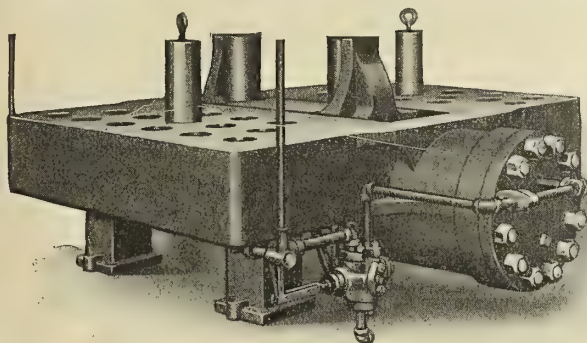
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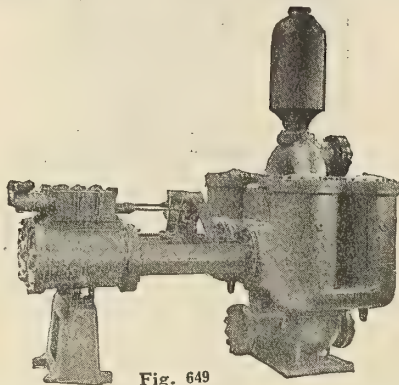


Fig. 649

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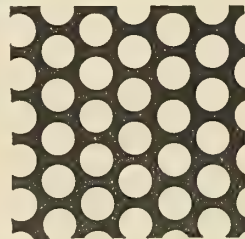
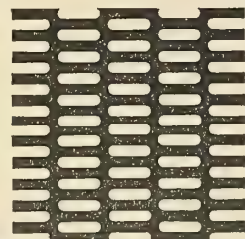
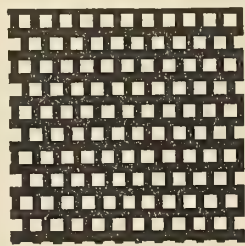
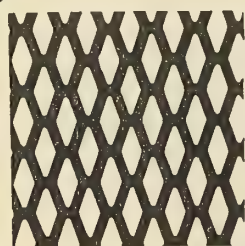
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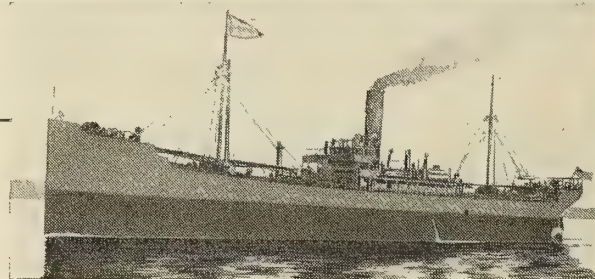
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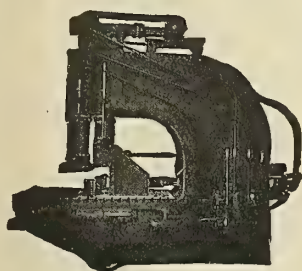
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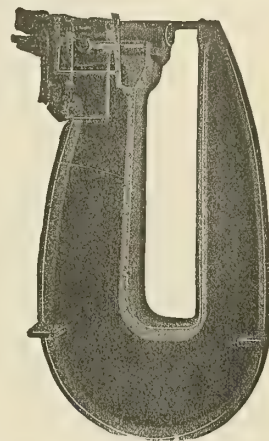
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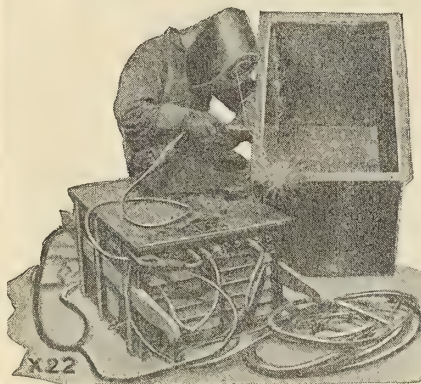
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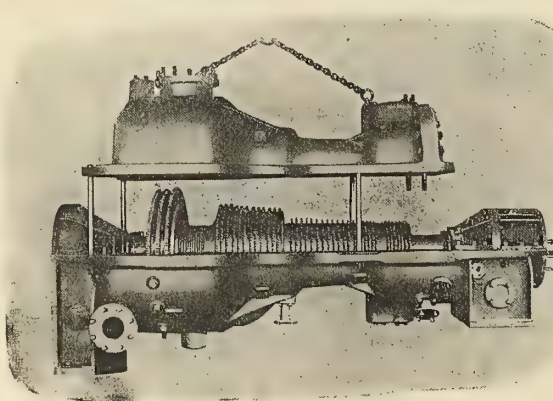
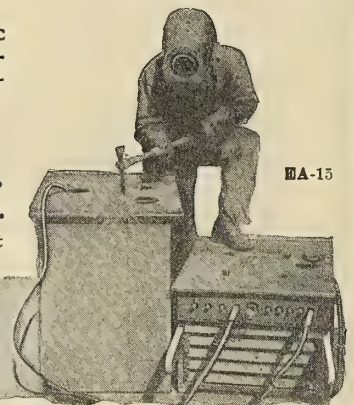
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Williams, Wm. E.

Attorneys-At-Law

Ansell & Bailey.

Automatic Fire Alarms

(See Fire Alarms)
Williams, Wm. E.

Automatic Injectors

Lunkenheimer Co., The
Williams, Wm. E.

Automatic Towing Machines

(See Towing Machines)

Axles—Railway and Locomotive

Pollak Steel Co.

Babbitt Metal

Post Co., E. L.
Williams, Wm. E.

Back Pressure Valves

Griscom-Russell Co.
Williams, Wm. E.

Ballast Pumps

Davidson Co., M. T.
Fairbanks-Morse Co.
Ingersoll-Rand Co.
Warren Steam Pump Co.

Bands, Rolled Steel

Pollak Steel Co.

Barges

Baltimore Dry Docks & Shipbuilding Co.
Charleston Dry Dock & Machine Co.
Johnson Iron Works, Ltd.

Barge Derricks

Lidgerwood Manufacturing Co.

Barometers

Taylor Instrument Companies.
Williams, Wm. E.

Bars—Steel

Pollak Steel Co.
Williams, Wm. E.

Bars and Angles

Pollak Steel Co.

Bath Pumps

Mott Iron Works, J. L.
Sands & Son Co., A. B.
Williams, Wm. E.

Bath Tubs

Crane Co.
Mott Iron Works, J. L.
Sands, A. B., & Son Co.
Williams, Wm. E.

Beading Machines

The Quickwork Co.

Beams, Channels, Angles

Pollak Steel Co.

Bearings

(See Ball Bearings and Roller Bearings)

Bearing Metals

Post Co., E. L.

Belting

(Also see Rubber Belting)
Williams, Wm. E.

Belt Dressing

Williams, Wm. E.

Bench Tools

Brubaker, W. L., & Cro.
Williams & Co., J. H.
Williams, Wm. E.

Bending Machines

(Keel Plate or Cardboard; also see Pipe Bending Machines)
Buffalo Forge Co.
Niles-Bement-Pond Co.
Watson-Stillman Co.

Bending Rolls

(See Rolls)

Berths

Southern-Rome Co.

Beveling and Splitting

Shears
Cleveland Punch & Shear Works Co.
Niles-Bement-Pond Co.

Bilge Pumps

Alberger Pump & Condenser Co.
Davidson Co., M. T.
DeLaval Steam Turbine Co.
Fairbanks-Morse Co.
Kerr Turbine Co.
Sands, A. B., & Son, Co.
Tiebout, W. & J.
Warren Steam Pump Co.
Williams, Wm. E.

Binnacles

Williams, Wm. E.

Binoculars

Williams, Wm. E.

Bits

Williams, Wm. E.

Bits

American Engineering Co.
Hyde Windlass Co.
Williams, Wm. E.

Bituminous Coatings

Briggs Bituminous Composition Co., Inc.
Walles Dove-Hermiston Corp.

Blocks

(See Chain Hoists and Blocks; also Tackle Blocks)
Union Hardware Co.

Blowers

(Also see Soot Blowers)
Buffalo Forge Co.
De Laval Steam Turbine Co.
General Electric Co.
Kearfott Engineering Co.
Kerr Turbine Co.
Westinghouse Electric & Mfg. Co.

Blow-Off Valves

Crane Co., The
Lunkenheimer Co., The
Powell Co., The William
Pratt & Cady Co., Inc.
Williams, Wm. E.

Boat Accessories

Sands, A. B., & Son Co.
Steward Davit & Equip. Corp.
Williams, Wm. E.

Boat Builders

(See Launches and Yachts)

Boat Davits

(See Davits).

Boat Fittings

Sands, A. B., & Son, Co.
Tiebout, W. & J.
Williams, Wm. E.

Boat Nails

Williams, Wm. E.

Boats

(See Life Boats; also Launches and Yachts)

Boilers

American Spiral Pipe Works
Babcock & Wilcox Co.
Baltimore Dry Docks & Shipbuilding Co.
Bath Iron Works.
Bethlehem Shipbuilding Corp.
Charleston Dry Dock & Machine Co.
Consolidated Shipbuilding Corp.
Foster Marine Boiler Corp.
Heine Safety Boiler Co.
Hyde Windlass Co.
Johnson Iron Works, Ltd.
Kearfott Engineering Co.
Lake Erie Boiler Works.
New York Engineering Co.
Staten Island Shipbuilding Co.
Vulcan Iron Works, Inc.
Ward, Charles, Eng. Works.

Boiler Compounds

Waycott, A. K.

Boiler Coverings

(See Non-Conducting Coverings)

Boiler Expanders

Watson-Stillman Co.
Williams, Wm. E.

Boiler Feeders

(See Feed-water Regulators)

Boiler Feed Pumps

(See Pumps)
Alberger Pump & Condenser Co.
Davidson Co., M. T.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Kerr Turbine Co.
Warren Steam Pump Co.
Williams, Wm. E.

Boiler Flue Cleaners

The Diamond Power Specialty Co.
Maritime Engineering & Sales Corp.
Williams, Wm. E.

Boiler Gauge Glasses

(See Gauge Glasses)

Boiler Makers' Test Pumps

(See Test Pumps)



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VIKING Marine Engine Oil—for thrust bearing and reciprocating engine lubrication—is the latest development among the Sun Marine Oils. It conforms in efficiency with the high standards maintained for years in the famous Sun XX Marine Oil.

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The body of this emulsion may be varied from a heavy pastelike substance to any consistency by the simple addition of a larger percentage of water.

For lubrication of thrust bearings an emulsion of Viking Oil with from 50 to 75 per cent water is recommended.

When used for main bearings without the addition of water, Viking Oil has high viscosity and extremely low internal frictional values. It will absorb any water that may find its way into the bearings and will feed indefinitely through a wick without clogging the pores.

Although having the saponifiable value

of oils highly compounded with blown rape seed, Viking Marine Engine Oil will not deteriorate and become rancid with age.

In addition, Viking Oil is neutral in reaction and contains no fatty acids, thus eliminating the corrosion of metal parts produced by the high acid content of most marine oils. It is unaffected by low temperatures.

The Sun Company is one of the world's largest producers, refiners and shippers of petroleum products. Its output of lubricating oils alone exceeds a million and a half gallons per week.

The Sun Company has specialized for a quarter century in lubricating oils. It has developed into an organization of lubrication experts, its aim being to supply accurate and efficient lubrication instead of just "oil."

The choice of a lubricant for any particular purpose demands expert advice. Engineers of the Sun Company are available to make an analysis of your lubrication requirements and specify the right oils to meet them. This service is free.

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Indianapolis
Jackson, Mich.
Kansas City, Mo.
Los Angeles

Milwaukee
Montreal
Newark
New Orleans

New York
Norfolk
Pittsburgh
San Francisco

St. Louis
Syracuse
Toledo
Toronto

Boiler Nozzles, Welded Steel American Spiral Pipe Works Continental Iron Works, The	Brokers (See Ship Brokers)	Cargo Winches (See Winches)	Williams Co., J. H. Union Hardware Co.	Coal-Handling Machinery Lidgerwood Mfg. Co. McMyler Interstate Co. Shepard Electric Crane & Hoist Co.
Boiler Plates (See Steel Plates)	Bronze American Manganese Bronze Co. Chase Metal Works Chase Rolling Mill Co. Columbian Bronze Corp. Crane Co. Lunkenheimer Co. Powell Co., The William Williams, Wm. E.	Castings—Aluminum Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co., The Powell Co., The William Sands, A. B., & Son Co.	Chain Stoppers American Engineering Co. Williams, Wm. E.	Coatings (See Anti-Rust Coatings)
Boiler Rivets (See Rivets)	Bunks Southern-Rome Co.	Castings—Brass Charleston Dry Dock & Machine Co. Crane Co. Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co., The Powell Co., The William Sands, A. B., & Son Co. Tiebout, W. & J. Williams, Wm. E.	Chain Valve Wheels Lunkenheimer Co., The Powell Co., The William	Cocks (See Gauge Cocks)
Boiler Riveters (See Power Riveters)	Buoys Williams, Wm. E.	Castings—Bronze American Manganese Bronze Co. American Steel Foundries Charleston Dry Dock & Machine Co. Chase Metal Works Chase Rolling Mill Co. Columbian Bronze Co. Crane Co., The Ferguson-Herbert Corp'n Lunkenheimer Co., The Powell Co., The William Sands, A. B., & Son Co. Tiebout, W. & J. Williams, Wm. E.	Channels Pollak Steel Co.	Combined Air and Circulat- ing Pumps Wheeler Mfg. Co.
Boiler Room Fittings Ashton Valve Co. Crane Co., The Jerguson Gage & Valve Co. Kearfott Engineering Co. Lunkenheimer Co., The Powell Co., The William Row & Davis, Engineers, Inc. Williams, Wm. E.	Buoys, Ring Williams, Wm. E.	Casting—Bronze American Manganese Bronze Co. American Steel Foundries Charleston Dry Dock & Machine Co. Chase Metal Works Chase Rolling Mill Co. Columbian Bronze Co. Crane Co., The Ferguson-Herbert Corp'n Lunkenheimer Co., The Powell Co., The William Sands, A. B., & Son Co. Tiebout, W. & J. Williams, Wm. E.	Charcoal Iron Boiler Tubes Kearfott Engineering Co. Parkesburg Iron Co. Williams, Wm. E.	Companion Flanges Crane Co., The Lunkenheimer Co., The Powell Co., The William Williams, Wm. E.
Boiler Staybolts (See Staybolts)	Burners, Fuel Oil (See Fuel Oil Burners)	Castings—Brass and Bronze Bath Iron Works	Check Valves—Brass and Iron Crane Co., The Lunkenheimer Co., The Mott Iron Works, J. L. Powell Co., The William Pratt & Cady Co., Inc. Sands & Son Co., A. B. Watson-Stillman Co. Williams, Wm. E.	Compasses Sperry Gyroscope Co., Williams, Wm. E.
Boiler, Steam and Water Drums, Welded Continental Iron Works, The	Bushings Crane Co., The Lunkenheimer Co., The Williams, Wm. E.	Castings—Gray Iron Ferguson-Herbert Corp'n. Norwalk Iron Works Williams, Wm. E.	Chemicals (See Boiler Compounds)	Compositions (See Ship's Compositions)
Boiler Tube Retarders Williams, Wm. E.	By-Pass Valves Crane Co., The Griscom-Russell Co. Lunkenheimer Co., The Powell Co., The William	Castings—Steel American Steel Foundries Bethlehem Shipbldg. Corp. Chase Metal Works Chase Rolling Mill Co. Crane Co., The Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co., The National Malleable Cast- ings Co. Sands, A. B., & Son Co.	Chipping Hammers (See Pneumatic Tools)	Compounds (See Boiler Compounds) (See Rust Cutting and Re- moving Fluid)
Boiler Tubes Kearfott Engineering Co. National Tube Co. Parkesburg Iron Co. Williams, Wm. E.	Cables (See Chain; also Rope) National Malleable Cast- ings Co.	Castings—Brass and Bronze Bath Iron Works	Chisels Williams, Wm. E.	Compression Riveters (See Power Riveters)
Bolts and Nuts Russell, Burdall & Ward Bolt & Nut Co. Williams, Wm. E.	Cableways (See Marine Cableways)	Castings—Gray Iron Ferguson-Herbert Corp'n. Norwalk Iron Works Williams, Wm. E.	Chisel Blanks Cleveland Punch & Shear Works Co. Ingersoll-Rand Co. Keller Pneumatic Tool Co.	Condensers Alberger Pump & Condenser Co. denser Co. American Engineering Co. Bath Iron Works Consolidated Shipbuilding Corp. Davidson Co., M. T. Griscom-Russell Co. Ingersoll-Rand Co. Kearfott Engineering Co. National Marine Engine Works Row & Davis, Engineers, Inc. Warren Steam Pump Co. Westinghouse Electric & Mfg. Co. Wheeler Condenser & Eng. Co. Wheeler Mfg. Co., C. H. Williams, Wm. E.
Booms—Tubular Steel National Tube Co.	Caliper Gauges Williams & Co., J. H.	Castings—Steel American Steel Foundries Bethlehem Shipbldg. Corp. Chase Metal Works Chase Rolling Mill Co. Crane Co., The Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co., The National Malleable Cast- ings Co. Sands, A. B., & Son Co.	Chronometers Williams, Wm. E.	Condenser Tubes Chase Metal Works Chase Rolling Mill Co. Kearfott Engineering Co. Wheeler Condenser & Eng. Co. Williams, Wm. E.
Boring Bars (See Cylinder Boring Bars)	Calking Machinery Ingersoll-Rand Co.	Centrifugal Oil Purifiers De Laval Separator Co.	Chronometer Valves Williams, Wm. E.	Connecting Rods Pollak Steel Co. Williams & Co., J. H.
Boring Machines—Metal Working Ingersoll-Rand Co. Niles-Bement-Pond Co.	Calking Tools Williams, Wm. E.	Centrifugal Pumps Alberger Pump & Conden- ser Co. Fairbanks-Morse Co. Ingersoll-Rand Co. Kearfott Engineering Co. Kerr Turbine Co. Westinghouse Electric & Mfg. Co. Wheeler Manufacturing Co. Williams, Wm. E.	Checks American Engineering Co. Williams, Wm. E.	Consulting Engineers (See Engineers, Consult- ing)
Boring Machines—Wood Chicago Pneumatic Tool Co. Cleveland Pneumatic Tool Co. Ingersoll-Rand Co.	Cam Shafts Pollak Steel Co.	Ceilings (Cabin) Marine Decking & Supply Co.	Chock Fittings Steward Davit and Equip. Corp.	Conveying Machinery Lidgerwood Mfg. Co. McMyler Interstate Co.
Boring and Turning Mills Niles-Bement-Pond Co.	Canvas Williams, Wm. E.	Chain Kearfott Engineering Co. National Malleable Cast- ings Co.	Chucks Chicago Pneumatic Tool Co. Ingersoll-Rand Co. Keller Pneumatic Tool Co. Williams, Wm. E.	Conveyors (Coal) (See Conveying Machinery)
Brazing Materials. Smooth-On Mfg. Co.	Capstans (Steam, Electric, Hand) Allan-Cunningham Co. American Engineering Co. Bethlehem Shipbldg. Corp. Flory, S., Mfg. Co. Hadfield-Penfield Steel Co. Hyde Windlass Co. Maritime Engineering & Sales Corp. Williams, Wm. E.	Chain Hoists and Blocks Niles-Bement-Pond Co. Union Hardware Co. Williams, Wm. E. Yale & Towne Mfg. Co.	Circular Shears The Quickwork Co.	CO₂ Ice Machines (See Conveying Dioxide Machines)
Brass and Copper Chase Metal Works Chase Rolling Mill Co. Sands, A. B., & Son Co. Williams, Wm. E.	Carbon Dioxide Valves and Fittings Brunswick Refrigerating Co. Frick Co. York Manufacturing Co.	Chain Pipe Wrenches American Engineering Co. Williams, Wm. E.	Circulating Pumps Alberger Pump & Con- denser Co. Davidson Company, M. T. De Laval Steam Turbine Co. Fairbanks-Morse Co. Ingersoll-Rand Co. Warren Steam Pump Co. Westinghouse Electric & Mfg. Co. Wheeler Mfg. Co., C. H. Williams, Wm. E.	Coolers—Oil Coppers (See Oil Coolers)
Brass Castings (See Castings—Brass)	Carbon Dioxide Machine Brunswick Refrigerating Co. Frick Co. York Manufacturing Co.		Circulators (See Boiler Circulators)	
Brass Fittings Ashton Valve Co. Chase Rolling Mill Co. Crane Company, The Lunkenheimer Co., The Powell Co., The William Sands, A. B., & Sons Co. Tiebout, W. & J. Williams, Wm. E.	Car Dumpers Brown Hoisting Machinery Co. McMyler Interstate Co.		Clamps—Machinists and Tool Makers Williams & Co., J. H. Williams, Wm. E.	
Brick (See Fire Brick)	Cargo Hoists (See Hoisting Engines)		Clinch Rings Williams, Wm. E.	
Bridge Control Westinghouse Electric & Mfg. Co.	Cargo Lights General Electric Co. Williams, Wm. E.		Clocks Ashton Valve Co. Williams, Wm. E.	
Bridge Walls (See Furnace Bridge Walls)				



“Straightening out like a Fiddle String” Naco Chain HELD

THE experience of Captain Jamison as told in his letter of April 11th has been the common finding whenever Naco Chain has been put to an emergency test.

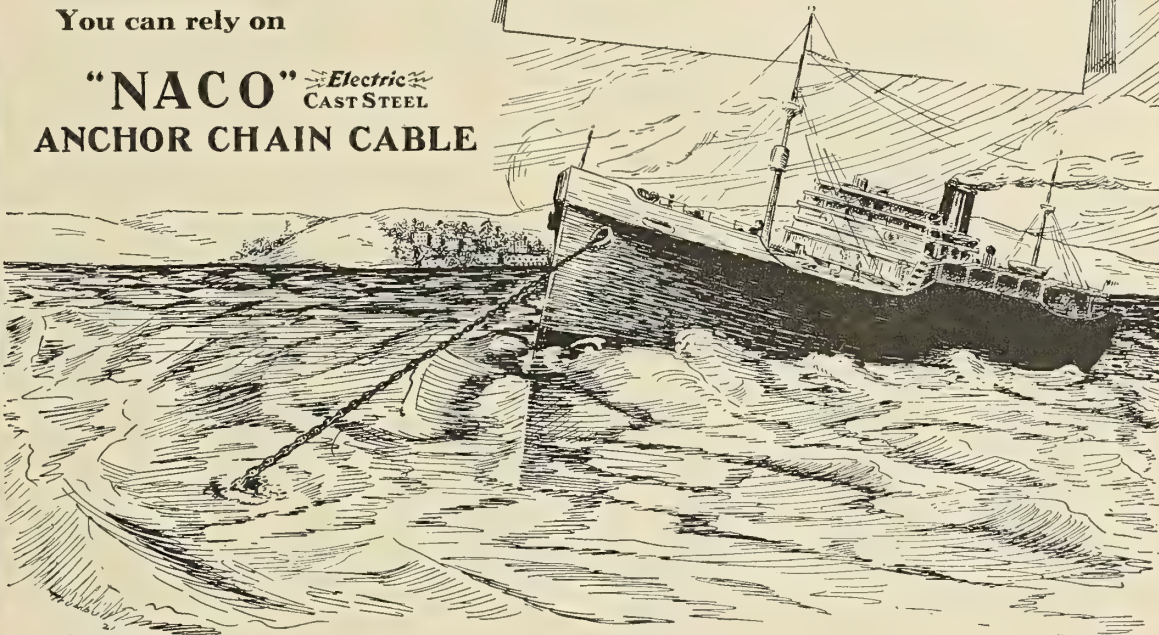
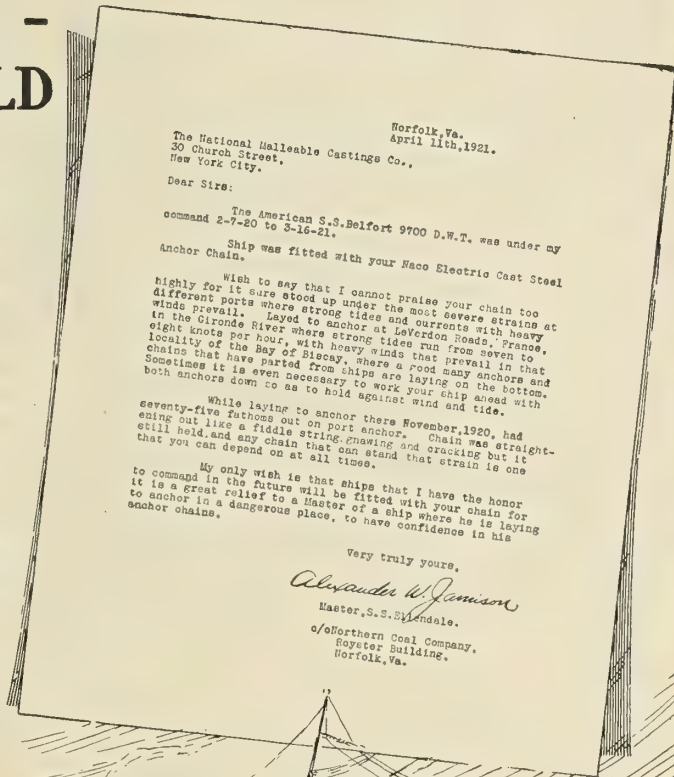
It has always been found dependable.

And to use Captain Jamison's own words—“it is a great relief to a Master of a ship to have a dependable chain—one that he can place his confidence in.” To know that when the crisis comes, and life depends upon the tenacity of a single link, stud, or shackle, that his anchor chain will hold.

Naco chain is built to inspire that confidence—it is built to meet the emergency. Its tested strength, 40% greater than that of any other type of stud link cable, gives assurance of a reserve strength adequate to resist the excessive strains imposed in times of peril.

You can rely on

“NACO” Electric CAST STEEL
ANCHOR CHAIN CABLE



THE NATIONAL MALLEABLE CASTINGS Co.
CLEVELAND, OHIO

Copper (See Brass and Copper)	Deck Pumps Sands & Son Co., A. B. Warren Steam Pump Co. Williams, Wm. E.	Drills, Electric (See Electric Drills)	Electric Hoists Allan-Cunningham Co. American Engineering Co. Brown Hoisting Machinery Co. Chicago Pneumatic Tool Co. General Electric Co. Hyde Windlass Co. Lidgerwood Mfg. Co. Maritime Engineering & Sales Corp. Niles-Bement-Pond Co. Shepard Elec. Crane & Hoist Co.	Ly-aholm, Henry, Inc. Matthews, John B. McClelland & Co., N. E., Ltd. McKinlay, James McNab Co., The Nilson, Leonard J. Peerless Eng. Co. Reid & Co., John Rimmer, A. C. Rossell & Thayer Row & Davis, Engineers, Inc. Sharp, Geo. G. Tams, Lemoline & Crane Watts, J. Murray Whittelsey & Whittelsey
Copper Tubes, Rods, Wires Chase Metal Works Chase Rolling Mill Co. Williams, Wm. E.	Decking Long-Bell Lumber Co. Marine Decking & Supply Co.	Drills, Pneumatic (See Pneumatic Tools)	Electric Lighting General Electric Co.	Engines for Auxiliaries Consolidated Shipbuilding Corp. De Laval Steam Turbine Co. Fairbanks-Morse Co. Hyde Windlass Co. Kearfott Engineering Co. Kerr Turbine Co. McIntosh & Seymour Corp. New London Ship & Engine Co. Westinghouse Electric & Mfg. Co.
Cordage (Also see Rope and Wire Rope; also Twine) American Mfg. Co. Columbian Rope Co. Griscom-Russell Co. Plymouth Cordage Co. Whitlock Cordage Co. Williams, Wm. E.	Derricks Lidgerwood Mfg. Co. McMyler Interstate Co.	Drills, Portable (See Portable Drills)	Electric Meters (See Meters, Electric)	Engines, Gasoline (See Gasoline Engines)
Corrugated Furnaces Continental Iron Works, The	Derrick Cars McMyler Interstate Co.	Drills, Wall Radial (See Radial Drills)	Electric Plants Consolidated Shipbuilding Corp. Fairbanks-Morse Co. General Electric Co. Kerr Turbine Co. Westinghouse Electric & Mfg. Co.	Engines, Hoisting (See Hoisting Engines)
Counters (See Revolution Counters)	Derrick Irons Lidgerwood Mfg. Co. J. S. Mundy Hoisting Engine Co.	Drop Forgings (Eye Bolts, Wrenches, Etc.) Pollak Steel Co. Williams & Co., J. H. Williams, Wm. E.	Electric Pumps (See Electric Driven Pumps)	Engines, Kerosene (See Kerosene Engines)
Couplings (See Hose Couplings)	Detaching Gear (Boat) Steward Davit & Equip. Corp.	Drop Hammers Chambersburg Engineering Co. Niles-Bement-Pond Co.	Electric Welding (See Welding, Electric)	Engines, Oil (Also see Diesel Engines) Chicago Pneumatic Tool Co. Consolidated Shipbuilding Corp. Haddfield-Penfield Steel Co. Ingersoll-Rand Co. Johnson Iron Works, Ltd. Kearfott Engineering Co. McIntosh & Seymour Corp. New London Ship & Engine Co. Standard Motor Construction Co. Winton Engine Co.
Coverings— Non-Conducting (See Non-conducting Coverings)	Diaphragm Pumps Hyde Windlass Co.	Dry Dock Pumps Alberger Pump & Condenser Co. Morris Machine Works	Electrical Appliances, Installations, Fittings and Supplies General Electric Co. Williams, Wm. E.	Engines, Propelling Bath Iron Works Bethlehem Shipbuilding Corp. Consolidated Shipbuilding Corp. Fairbanks-Morse Co. Haddfield-Penfield Steel Co. Ingersoll-Rand Co. Kearfott Engineering Co. Los Angeles Shipbuilding & Dry Dock Co. McIntosh & Seymour Corp. New London Ship & Engine Co. Standard Motor Construction Co. Staten Island Shipbuilding Co. Trout Co., H. G. Ward, Chas., Engineering Works Winton Engine Co.
Cranes (Also see Floating Cranes and Shipyards Whirlers) American Engineering Co. Brown Hoisting Machinery Co. Chambersburg Engineering Co. McMyler Interstate Co. Niles-Bement-Pond Co. Shepard Electric Crane & Hoist Co.	Die Blocks Pollak Steel Co.	Dry Docks (Manufacturer and Marine Railways) Bethlehem Shipbldg. Corp. Crandall Engineering Co.	Electrical Instruments General Electric Co. Williams, Wm. E.	Engine Logs Williams, Wm. E.
Crank Shafts Pollak Steel Co. Williams & Co., J. H.	Dies Brubaker & Bros., W. L. Cleveland Punch & Shear Works Co. Williams, Wm. E.	Dry Docks and Marine Railways Baltimore Dry Docks & Shipbuilding Co. Bethlehem Shipbuilding Corp., Ltd. Charleston Dry Dock & Machine Co. Merchant Shipbuilding Corp. Newport News Shipbuilding & Dry Dock Co. Shewan & Son, James, Co. Staten Island Shipbuilding Corp. Alex. Stephen & Sons, Ltd. Sun Shipbuilding Co. Todd Shipyards Corp. Yarrow & Co., Ltd.	Electrical Wiring Devices (Switches, Sockets, Etc.) Williams, Wm. E.	Engine Oil (See Lubricants)
Creosoted Timbers, Piling, Etc. Long-Bell Lumber Co.	Diesel Engines (Also see Engines, Oil) Haddfield-Penfield Steel Co. Kearfott Engineering Co. McIntosh & Seymour Corp. New London Ship & Engine Co. Winton Engine Works	Dynamamos (See Electric Plants)	Elevators, Air and Hydraulic (Also see Portable Elevators)	Engine Packing (See Packing)
Cutters Williams, Wm. E.	Direct-Connected Sets (See Electrical Plants)	Eccentric Rods Pollak Steel Co.	Engine Room Counters (See Revolution Counters)	Engineers, Consulting—Marine American Engineering Co. Bogert, J. L. Bonner, William T. Cathcart, Wm. L. Chapman & Fisher Cox & Stevens Crandall Engineering Co. Donnelly, W. T. Ferris, Theodore Jansson & Gamon Jacobs Co., J. L. Haag, A. H. Haight, Robert S. Hansen, Max. Harris, Leonard B.
Cutting Compounds Williams, Wm. E.	Disengaging Gears Steward Davit & Equip. Corp.	Economizer, Fuel (See Fuel Economizer)	Engine Room Clocks (See Clocks)	
Cutting and Welding (See Welding)	Distillers (See Evaporators)	Ejectors Lunkenheimer Co. Williams, Wm. E.		
Cylinder Boring Bars Niles-Bement-Pond Co. Williams & Co., J. H.	Dock Fittings Williams, Wm. E.	Electric Cranes (See Electric Hoists)		
Cylinder Relief Valves (See Valves)	Draft Gauges Pneumercator Co. Williams, Wm. E.	Electric Drills and Grinders Chicago Pneumatic Tool Co. General Electric Co. Williams, Wm. E.		
Cylinders for Compressed Air, Gas, Etc. Continental Iron Works, The National Tube Co.	Drain Valves (See Valves)	Electric Driven Pumps Alberger Pump & Condenser Co. Fairbanks-Morse Co. Ingersoll-Rand Co.		
Davits Stewart Davit & Equip. Corp.	Dredging Machinery American Engineering Co. Flory Mfg. Co. Lidgerwood Mfg. Co. McMyler Interstate Co.	Electric Freight Trucks (See Freight-Handling)		
Deck Fittings Steward Davit & Equip. Corp. Williams, Wm. E.	Drift Pins Cleveland Punch & Shear Works Co. Williams, Wm. E.	Electric Fire Alarm Systems Aero Alarm Co.		
Deck Plates Sands & Son, A. B. Williams, Wm. E.	Drilling Machines Niles-Bement-Pond Co.	Electric Heaters General Electric Co.		
	Drills Williams, Wm. E.			

STEWARD

Life-saving Equipment



"Safety at Sea"

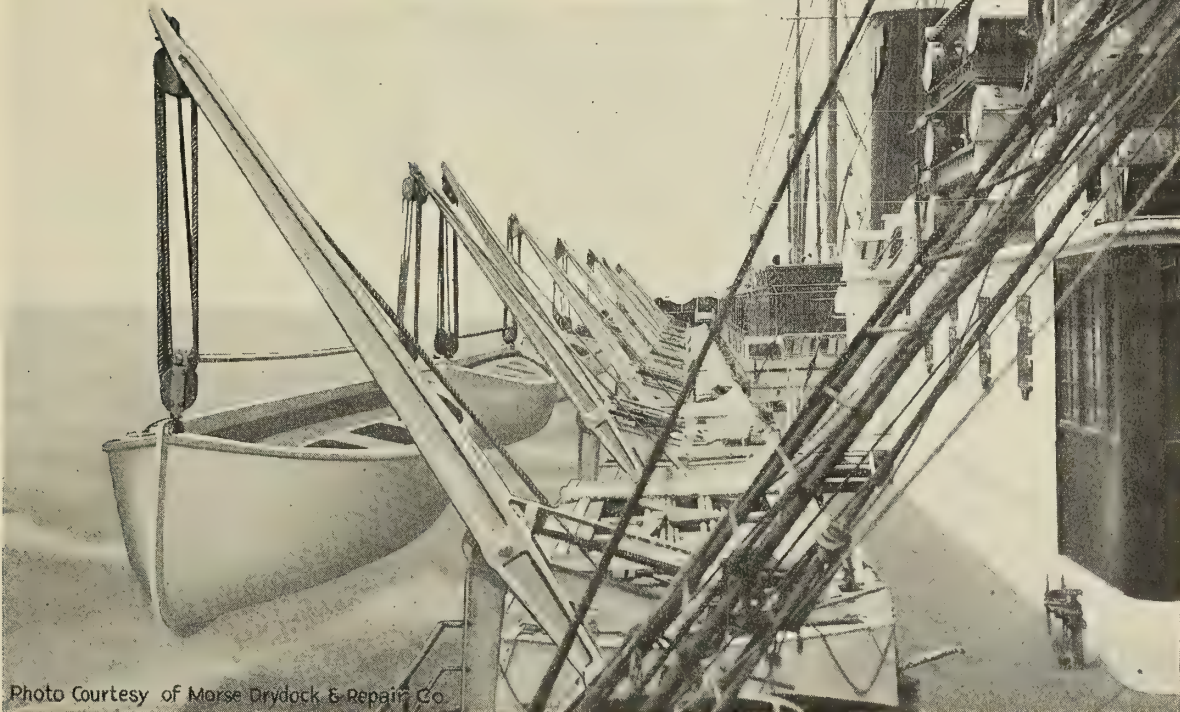


Photo Courtesy of Morse Drydock & Repair Co.

Life Saving Efficiency

At the 1921 spring meeting of the Institute of Naval Architects, Mr. Peskett, Naval Architect of the Cunard Line, very aptly said:

"Ships today are not built for the cost paid in pre-war days, and although safety must come before all other questions, the prevailing pressure in economic conditions seems to present a most opportune moment to develop what are most essential in life-saving appliances and to dispense with all that are likely to be impracticable."

The entire resources of the Steward Davit & Equipment Corporation are devoted to the saving of life at sea. Fully complying with the legal requirements in this country and abroad, it is our desire to provide life-saving equipment that may justly be classed as the most efficient and trustworthy in the world.

It has been our privilege to have a very broad experience, measured in ships served, in this particular field. Steward Life-Saving Equipment is now installed on a large number of vessels of the U. S. Navy, the U. S. Army Transport Service and in commercial lines; on cargo vessels, tankers and on many of the finest passenger ships afloat.

Steward Life-Saving Service

At your request we will send an engineer to your ship to make a detailed and strictly confidential report of the condition of your life-saving equipment. You will have the positive assurance that the laws have been complied with in proper form for your legal department and in the event of future need a dated and affirmed record will be on file for your protection. There is no charge for this service in New York waters.

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Engine-Room Supplies (See Steam Specialties)	Flags and Pennants Williams, Wm. E.	Fuel Oil Standard Oil Co. (New Jersey) Sun Co.	Gate Valves for Tank Steamers Pratt & Cady Co., Inc. Williams, Wm. E.	Grease Extractors Griscom-Russell Co. Row & Davis, Engineers, Inc. Williams, Wm. E.
Engine Room Telegraphs Williams, Wm. E.	Flanges American Spiral Pipe Works Crane Co., The Lunkenheimer Co., The Williams, Wm. E.	Fuel Oil Burners White Fuel Oil Engineering Corp. Williams, Wm. E.	Gauge Cocks Jerguson Gage & Valve Co. Lunkenheimer Co., The Powell Co., The William Pratt & Cady Co., The Sands & Son Co., A. B. Williams, Wm. E.	Grinders—Electric and Pneumatic Chicago Pneumatic Tool Co.
Engrave Stem Thermometers Taylor Instrument Companies	Flanging Machines Chambersburg Engineering Co. Niles-Bement-Pond Co. Watson-Stillman Co. Williams Co., J. H.	Fuel Oil Heaters Alberger Pump & Condenser Co. Griscom-Russell Co. Williams, Wm. E.	Gauge Glasses Crane Co., The Jerguson Gage & Valve Co. Lunkenheimer Co., The Powell Co., The William Schaeffer & Budenburg Mfg. Co. Williams, Wm. E.	Guillotine Shears Cleveland Punch & Shear Works Co. Niles-Bement-Pond Co.
Evaporators American Engineering Co. Davidson Co., M. T. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc. Williams, Wm. E.	Floating Cranes (Also see Cranes) McMyler-Interstate Co.	Fuel Oil Pumps Davidson Co., M. T. Warren Steam Pump Co.	Gauges (See Draft Gauges; also Tank Gauges)	Guy Anchors Crouse-Hinds Co.
Exhaust Fans (See Blowers)	Float Valves Crane Co., The Lunkenheimer Co., The	Furnace Bridge Walls Ferguson-Herbert Corp'n Wager Furnace Bridge Wall Co., Inc.	Gauges—Manufacturers' (Also see Steam Gauges)	Gyro-Compasses. Sperry Gyroscope Co.
Expanders (See Boiler Flue Expanders and Pipe Expanding and Flanging Machines)	Floating Dry Docks (See Dry Docks)	Furnace Fronts Continental Iron Works, The	Gears De Laval Steam Turbine Co. Falk Corp., The Kerr Turbine Co. Westinghouse Electric & Mfg. Co.	Gyro-Stabilizers. Sperry Gyroscope Co.
Expansion Joints Alberger Pump & Condenser Co. Crane Co., The Griscom-Russell Co. Lunkenheimer Co. Powell Co., The William	Floor Plates Crane Co., The	Furnaces (Also see Oil Furnaces) American Spiral Pipe Works Continental Iron Works, The	General Welding and Cutting Equipment (See Welding & Cutting Apparatus and Supplies)	Gypseys American Engineering Co. Hyde Windlass Co. Lidgerwood Mfg. Co.
Eye Bolts Williams & Co., J. H. Williams, Wm. E.	Flue Cleaners (See Boiler Flue Cleaners)	Fusible Plugs Crane Co., The Griscom-Russell Co. Lunkenheimer Co., the Williams, Wm. E.	Generating Sets Engberg's Electric & Mechanical Wks. Fairbanks-Morse Co. General Electric Co. Kerr Turbine Co. Westinghouse Electric & Mfg. Co. Williams, Wm. E.	Hammers Bradley & Son, C. C.
Fans (See Blowers)	Flue Cutters (See Boiler Flue Cutters)	Galley Pumps Mott Iron Works, J. L. Sands & Son, Co., A. B. Williams, Wm. E.	Generators Engberg's Electric & Mechanical Wks. Fairbanks-Morse Co. General Electric Co. Williams, Wm. E.	Hammers, Pneumatic (See Pneumatic Tools)
Feed Water Heaters Alberger Pump & Condenser Co. Griscom-Russell Co. Kearfott Engineering Co. Pratt & Cady Co., Inc. Row & Davis, Engineers, Inc. Williams, Wm. E.	Flue Hole Punches and Dies Cleveland Punch & Shear Works Co.	Galvanizing Material Sands, A. B., & Son Co. Tiebout, W. & J. Williams, Wm. E.	Globe Valves—Brass and Iron Crane Co., The Lunkenheimer Co., The Powell Co., The William Pratt & Cady Co., Inc. Williams, Wm. E.	Hammers, Steam Chambersburg Eng. Wks. Niles-Bement-Pond Co.
Feed Water Regulators Jerguson Gage & Valve Co. Kearfott Engineering Co. Pratt & Cady Co., Inc.	Fog Horns Williams, Wm. E.	Galleys (See Ranges)	Governors Cory, Chas., & Sons, Inc.	Hammocks (See Couch Hammocks)
Fences (See Wire Fences)	Forges C. C. Bradley & Son Buffalo Forge Co.	Gantry Cranes Niles-Bement-Pond Co.	Grate Bars Ferguson-Herbert Corp'n	Handles (Crank, Balance, Machine) Williams & Co., J. H.
Ferrules—Condenser Tube (See Condenser Tube Ferrules)	Forgings, Bronze Hyde Windlass Co. Pollak Steel Co.	Gas Compressors Norwalk Iron Works	Grease (See Lubricants)	Hardware (See Marine Hardware)
Files Williams, Wm. E.	Forgings, Iron and Steel (Also see Drop Forgings) Charleston Dry Dock & Machine Co. Pollak Steel Co.	Gas Engine Specialties Crane Co., The Lunkenheimer Co., The Powell Co., The William Pratt & Cady Co., Inc.	Grease Cups Crane Co., The Lunkenheimer Co., The Powell Co., The William Sun Co.	Hardwood (See Lumber)
Filters—Marine Oil Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc. Williams, Wm. E.	Freight-Handling Equipment Brown Hoisting Machinery Co. General Electric Co. Lidgerwood Mfg. Co. McMyler Interstate Co. Shepard Electric Crane & Hoist Co.	Gaskets (Also see Packing) Crane Co., The Goetze Gasket & Packing Co. Griscom-Russell Co. Smooth-On Mfg. Co. Williams, Wm. E.	Heat Insulation (Also see Non-Conducting Coverings) Magnesia Association of America	Hawse Pipes Ferguson-Herbert Corp'n
Fire Alarm Systems Aero Alarm Co. Kidde Co., Inc., Walter	Fuel Economizer Griscom-Russell Co. Magnesia Association of America	Gasoline Engines Consolidated Shipbuilding Corp. Fairbanks-Morse Co. Standard Motor Construction Co. Winton Engine Co.	Hoist Hooks Williams, J. H., & Co. Williams, Wm. E.	Hawser Reels Williams, Wm. E.
Fire Department Supplies Kidde Co., Inc., Walter		Gasoline Pumps Sands & Son Co., A. B.	Hoisting Engines Allan-Cunningham Co. American Engineering Co. Fairbanks-Morse Co. Flory Manufacturing Co., S. Hadfield-Penfield Steel Co. Hyde Windlass Co. Lidgerwood Mfg. Co. Maritime Engineering & Sales Corp.	Hawsers—Manila (Also see Rope and Wire Rope) American Mfg. Co. Columbian Rope Co. Plymouth Cordage Co. Whitlock Cordage Co. Williams, Wm. E.
Fire Extinguishers Kidde Co., Inc., Walter Williams, Wm. E.		Gate Valves — Brass and Iron Powell Co., The William Crane Co., The Lunkenheimer Co., The Pratt & Cady, Inc. Williams, Wm. E.		Heaters (Bath, Lavatory, Shower) Alberger Pump & Condenser Co. Griscom-Russell Co. Kearfott Engineering Co. Mott Iron Works, J. L. Pratt & Cady Co., The Sands & Son Co., A. B. Williams, Wm. E.
Fire Hose (See Hose)				Hemp (See Twine)
Fireproof Lumber (See Lumber, Fireproof)				
Fire Pumps Alberger Pump & Condenser Co. Warren Steam Pump Co.				



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This Company is in a position to offer to the Shipping interests world-wide facilities for bunkering with "Standard" Fuel Oil. This service makes possible the decided economies resulting from the use of "Standard" Fuel Oil.

Ports at which deliveries can be made through arrangements with the Standard Oil Company (New Jersey), 26 Broadway, N. Y.

UNITED STATES	MEXICO	UNITED KINGDOM
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*New York *Norfolk		*Manchester *Brixham
Boston *Charleston	PANAMA CANAL	*Southampton *Hull
*Philadelphia *New Orleans	Cristobal *Balboa	*Newcastle-On-Tyne
*Baltimore *Baton Rouge		*Sunderland *Thames Haven
<i>Pacific Coast Ports</i>	WEST INDIES	GERMANY
Tacoma *San Francisco	Havana Bermuda	Hamburg Nordenham
*Seattle *San Pedro	Cienfuegos Curacao	AFRICA
*Point Wells *San Diego	Nuevitas St. Thomas	Bizerta
Astoria *Honolulu	San Juan	TURKEY
*Richmond		Constantinople
CANADA	SOUTH AMERICA	GREECE
*Halifax *Vancouver	Rio de Janeiro Montevideo	Piraeus
*Montreal Prince Rupert	*Buenos Aires Valparaiso	CHINA
*Levis (Quebec)	*Campana *Talara	Hong Kong Shanghai
	*Diesel oil also available	JAPAN
		Itosaki Nagasaki

Arrangements will shortly be completed to cover ports in addition to those listed, as follows:

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Fort William, Ont.	Tocopilla, Chile	Helsingfors, Finland	Havre, France	Bourgas, Bulgaria
Hamilton, Ont.	Taltal, Chile	Aalborg, Denmark	Marseilles, France	Smyrna, Turkey
Sarnia, Ont.	Paíta, Peru	Copenhagen, Denmark	Dunkirk, France	Port Said, Egypt
Quebec (P. Q.)	Callao, Peru	Nyborg, Denmark	La Pallice, France	Alexandria, Egypt
St. John, N. B.	Bahia Blanca, Arg.	Avonmouth, U. K.	Genoa, Italy	Colombo, Ceylon
Victoria, B. C.	Ponta Delgada, Azores	Birkenhead, U. K.	Monopoli, Italy	Singapore, S. S.
Antilla, Cuba	Trondhjem, Norway	Cardiff, U. K.	Portici, Italy	Sydney, Australia
Matanzas, Cuba	Bergen, Norway	Rotterdam, Holland	Savona, Italy	Wellington, N. Z.
Antofagasta, Chile	Christiania, Norway	Amsterdam, Holland	Venice, Italy	Durban, S. A.
Iquique, Chile	Vallo, Norway	Antwerp, Belgium		

STANDARD OIL COMPANY (New Jersey)
26 Broadway, New York

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Hoists, Chain (See Chain Hoists)	Iron Cement , Smooth-on Mfg. Co.	Lines—Towing, Buoy (See Rope)	Marine Forgings (See Forgings)	Mineral Wool (See Non-Conducting Covering)
Hoists, Electric (See Electric Hoists)	Iron Pipe (See Pipe)	Loading and Unloading Equipment (See Freight-Handling Equipment)	Marine Glue Williams, Wm. E.	Mooring Engines American Engineering Co. Flory Mfg. Co., S. Hyde Windlass Co. Lidgerwood Mfg. Co.
Holders-On Chicago Pneumatic Tool Co. Ingersoll-Rand Co.	Iron Rust Remover The Rust Products Co.	Locks and Latches (See Ship Locks and Latches)	Marine Hardware Consolidated Shipbuilding Corp. Sands & Son Co., A. B. Tiebout, W. & J. Williams, Wm. E.	Motor Boats (See Launches and Yachts)
Hollow Boring Pollak Steel Co.	Jacks (Pneumatic) Gracey, R., & Sons Co. Watson-Stillman Co.	Locomotive Cranes (See Cranes)	Marine Heaters (See Heaters)	Motor Boat Supplies Tiebout, W. & J. Williams, Wm. E.
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Hose Coupling Chicago Pneumatic Tool Co. Cleveland Pneumatic Tool Co. Ingersoll-Rand Co. U. S. Rubber Co.	Journal Bearings (See Thrust Bearings)	Lubricating Oil Pumps Warren Steam Pump Co.	Marine Plumbing Crane Co., The Mott Iron Works, J. L. Sands & Son Co., A. B.	Multiple Drills Niles-Bement-Pond Co.
Humidifiers Griscom-Russell Co.	Jute American Mfg. Co. Columbian Rope Co.	Lubricators Crane Co. Griscom-Russell Co. Lunkenheimer Co. Powell Co., The William Sun Co.	Marine Railway Builders Crandall Engineering Co.	Multiple Punches Cleveland Punch & Shear Works Niles-Bement-Pond Co.
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Hygrometers Taylor Instrument Companies	Launches and Yachts (See shipbuilders)	Magnesia Goods and Materials Magnesia Association of America	Marine Securities Marine Corporation	Nipples Crane Co., The Lunkenheimer Co., The
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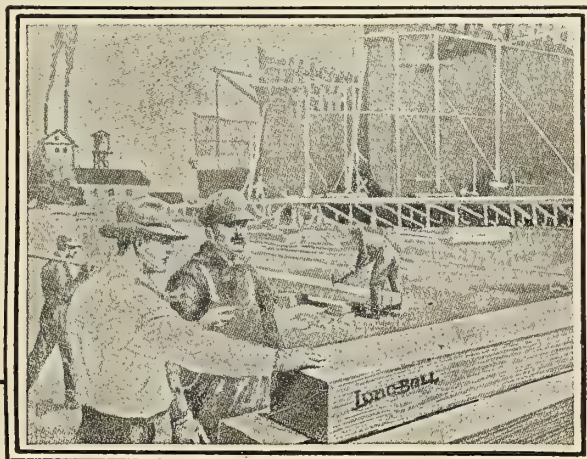
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There can be no compromise with poor lumber and

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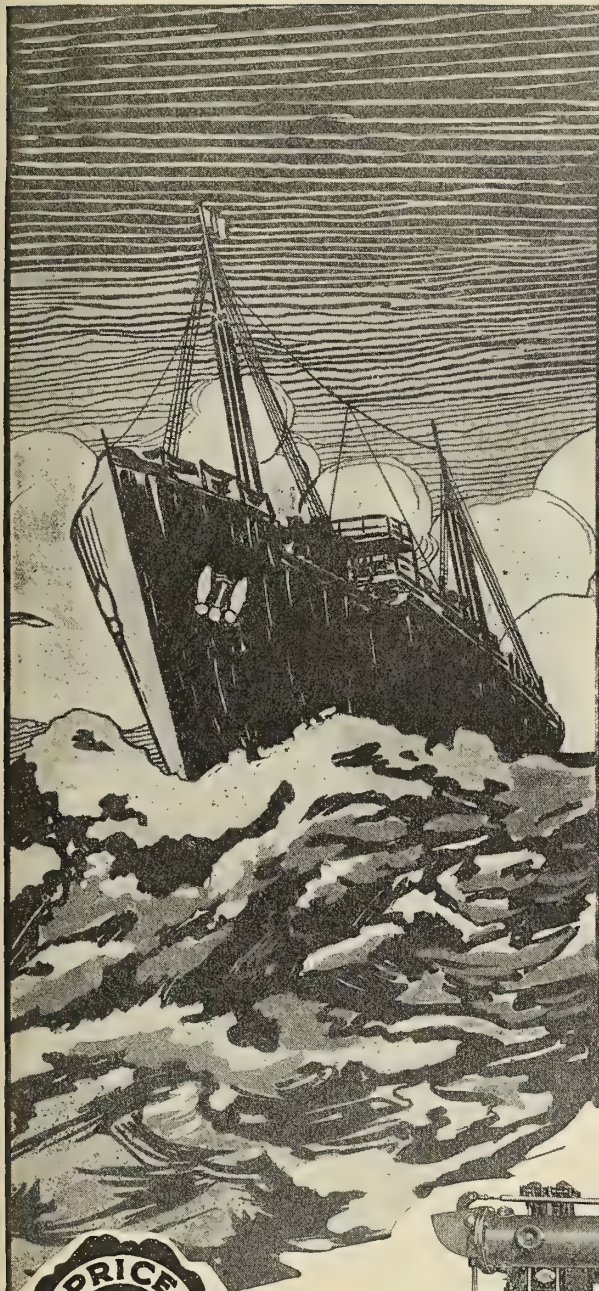
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Price Oil Engines are flexible. The average time for reversing from full speed ahead to full speed astern is only seven seconds. The engine control and reversing are accomplished by a single lever, there being no shifting of cams, camshafts or gears.

These oil engines operate on the four stroke cycle. Ignition is by temperature of compression only. The fuel atomization is direct and positive without the use of compressed air.

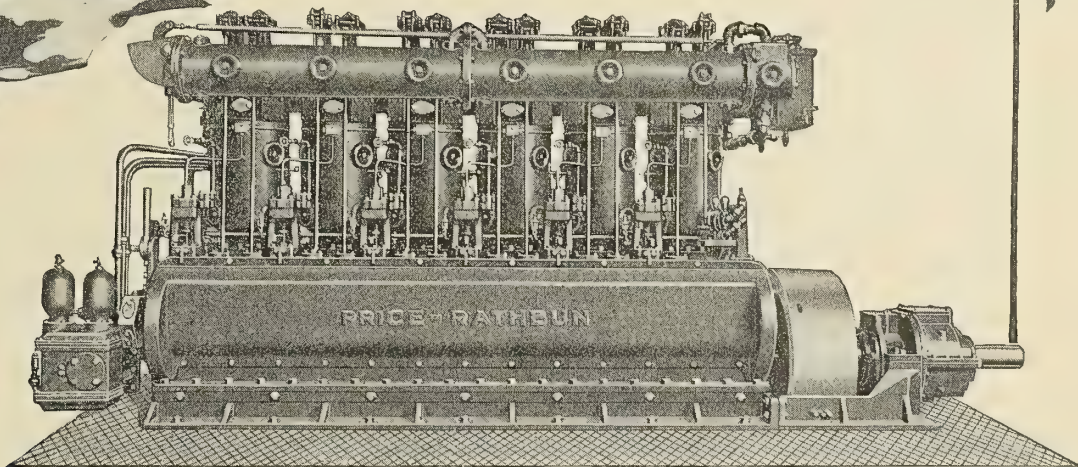
Price Marine Oil Engines are built in sizes ranging from 150 to 750 H.P.

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Rheostats General Electric Co.	Rubber Tiling (See Interlocking Rubber Tiling)	Shipbuilding Cranes (See Cranes)	Shop Cranes (See Cranes)	Steam Superheaters (See Marine Superheaters)
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Rivets Champion Rivet Co. Severance Mfg. Co., S.	Safes, Floating. Ocean Floating Safe Co.	Ship Clocks (See Clocks)	Sleeves (See Sockets and Sleeves)	Steam Turbine Dynamos De Laval Steam Turbine Co. General Electric Co. Kerr Turbine Co. Vulcan Iron Works, Inc. Westinghouse Electric & Mfg. Co.
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Riveters (See Pneumatic Riveters and Power Riveters)	Safety Valves (See Valves)	Ship Cows (See Cows)	Slotting Machines Niles-Bement-Pond Co.	Steel Pipe Crane Co. National Tube Co.
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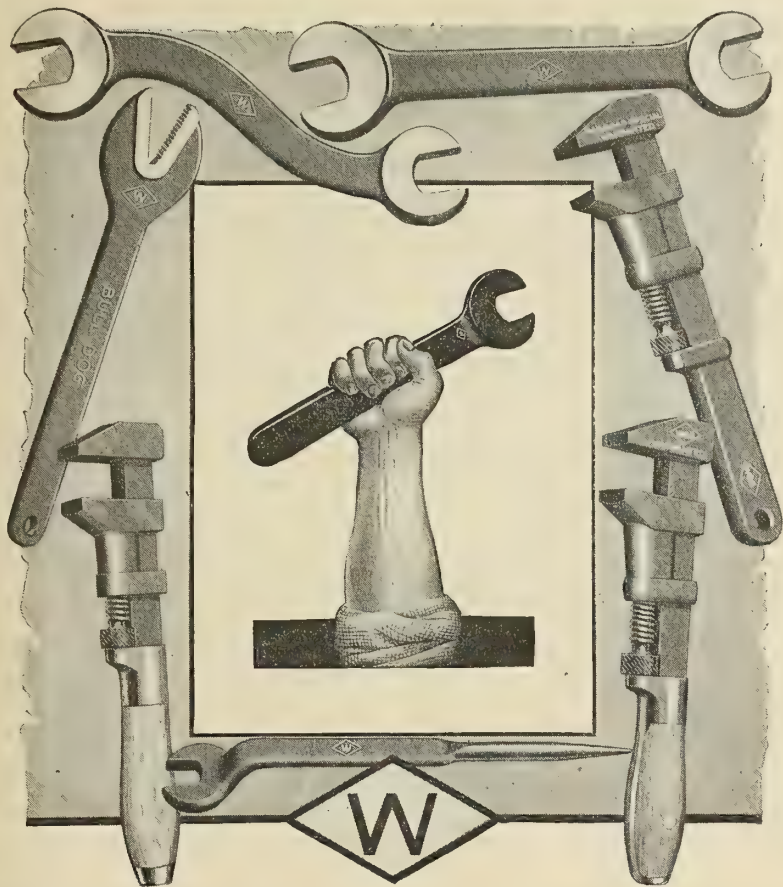
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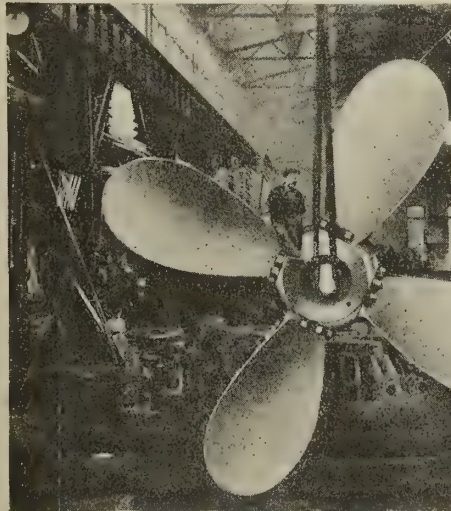
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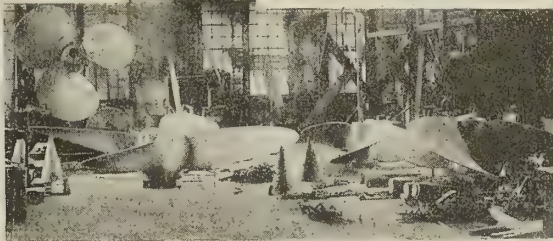
View of Foundry and Machine Shop from Main Line of Penna. R. R. to New York.



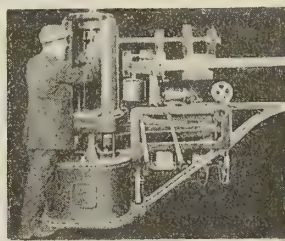
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Interior of Main Foundry Bay.



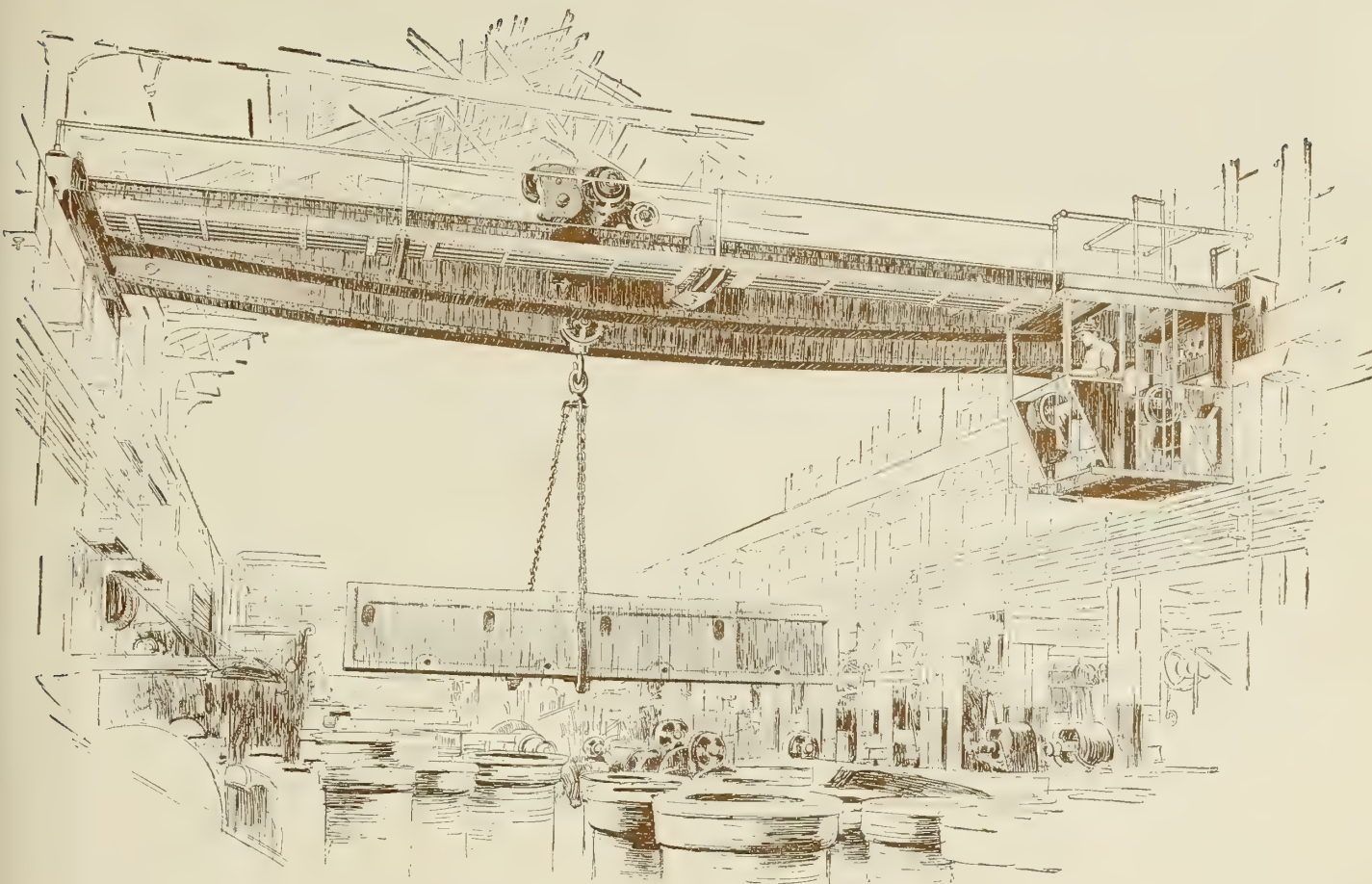
View of our Tinius Olsen Testing Machine.

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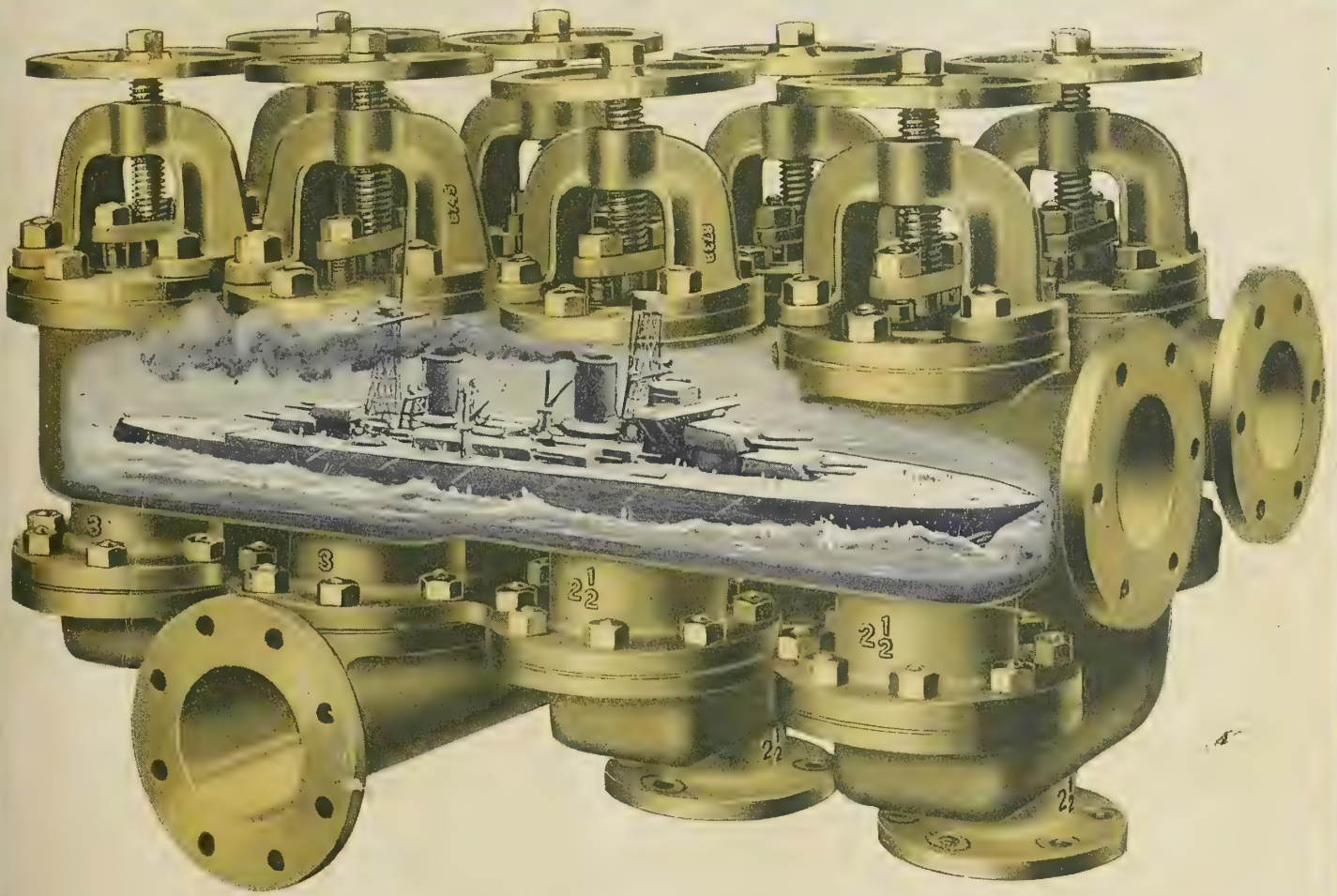


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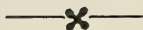
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Marine Engineering

And Shipping Age

Vol. XXVI

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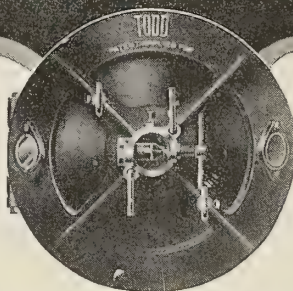
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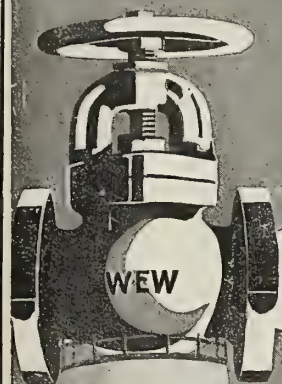
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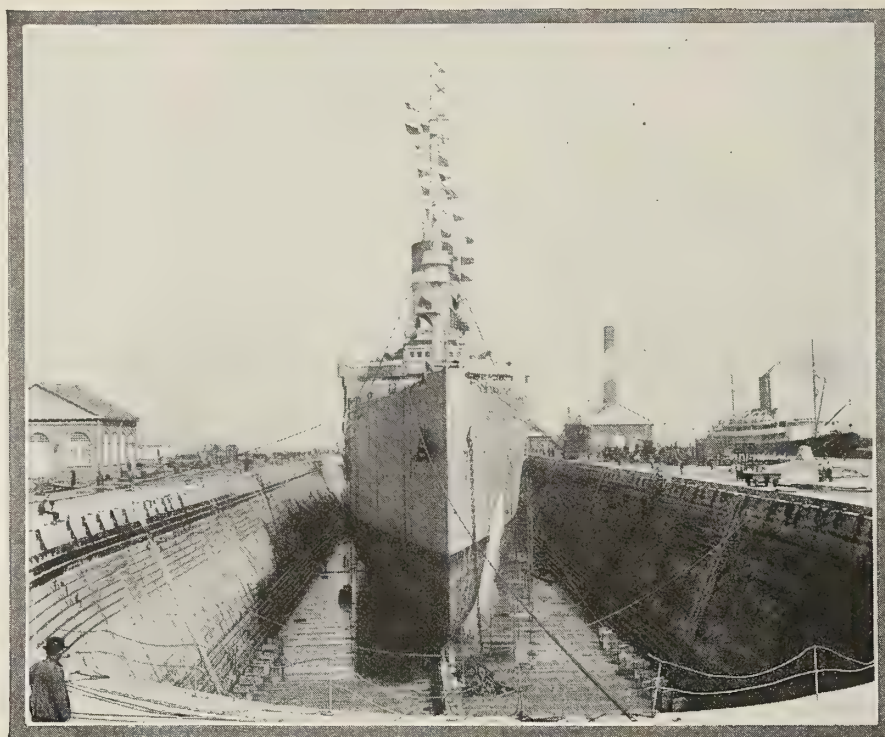
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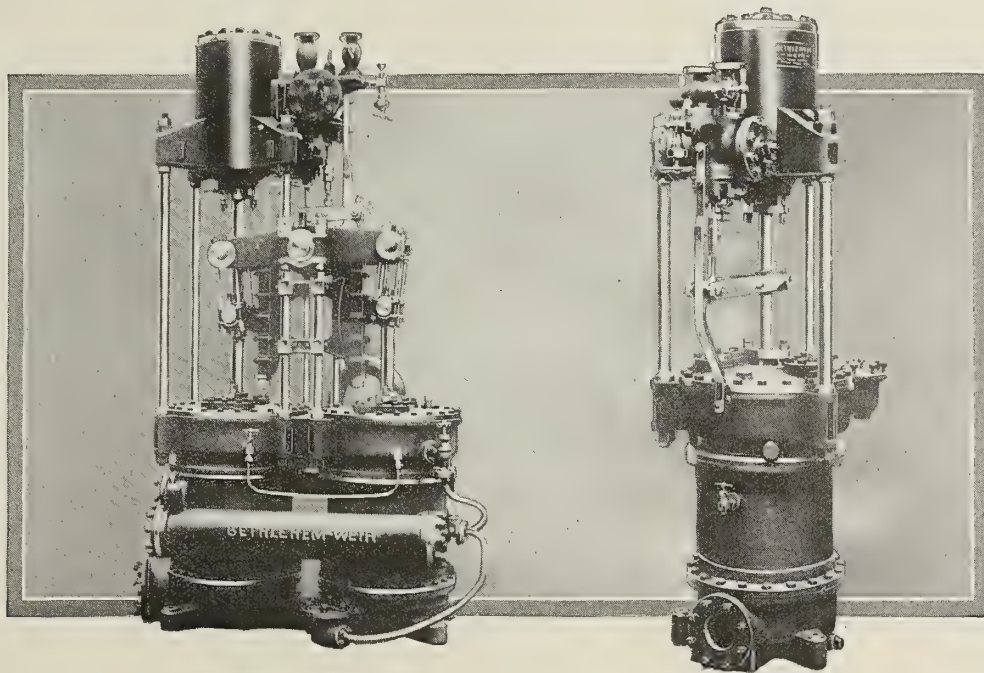
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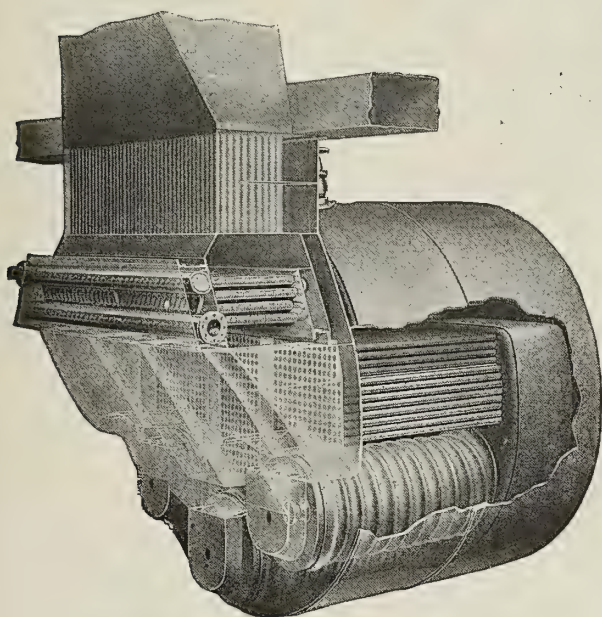
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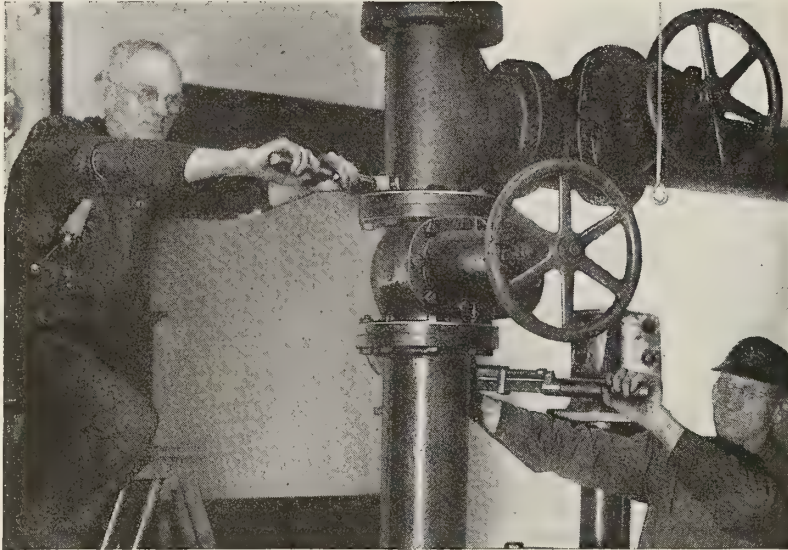
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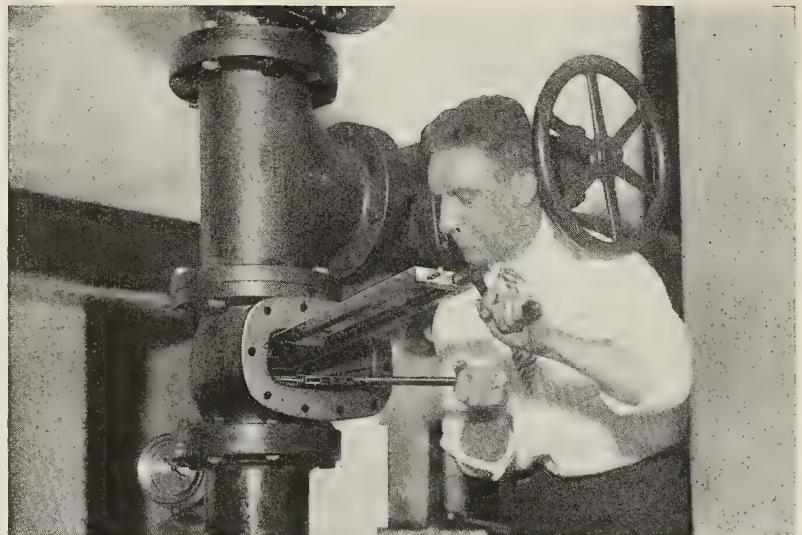
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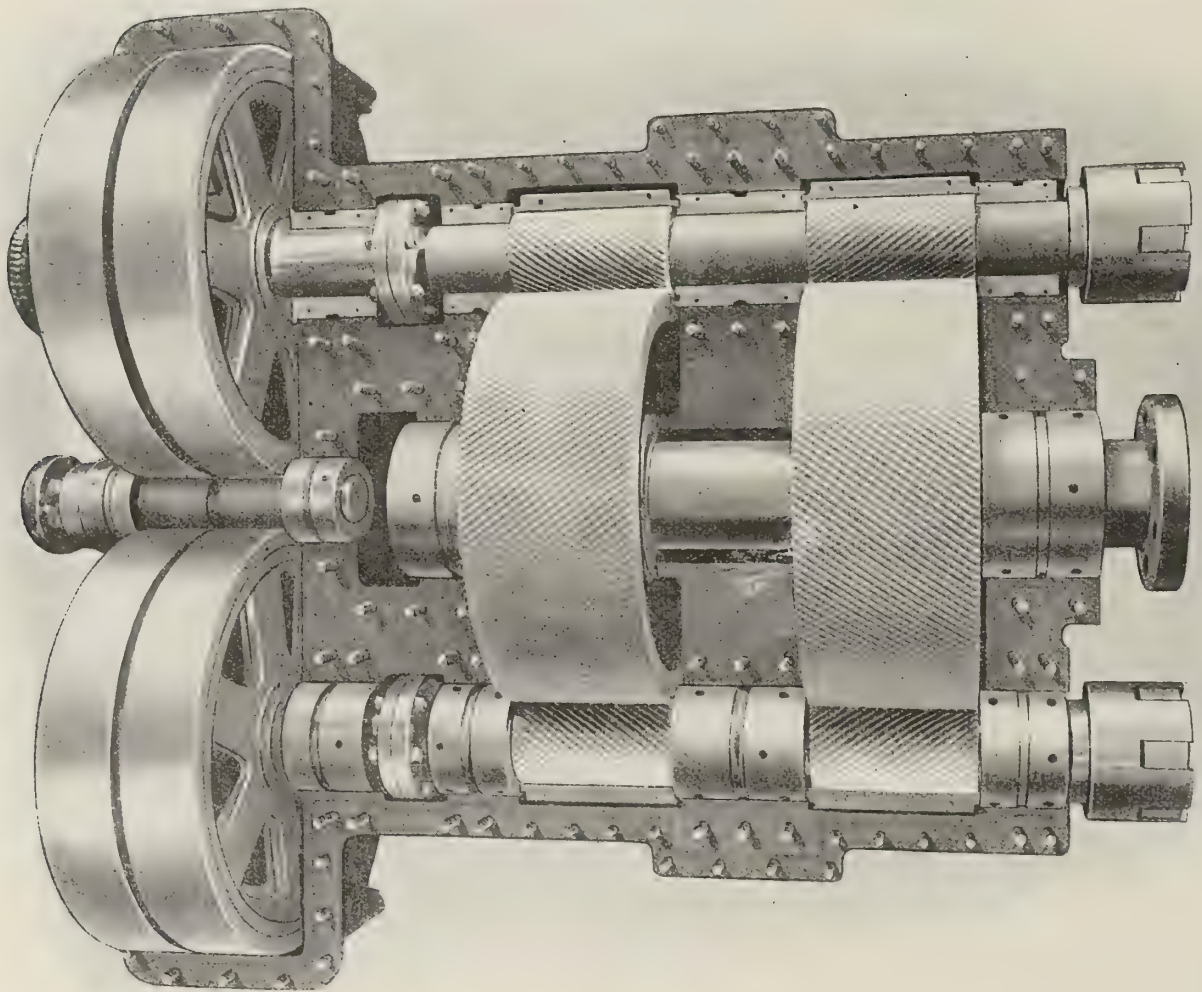
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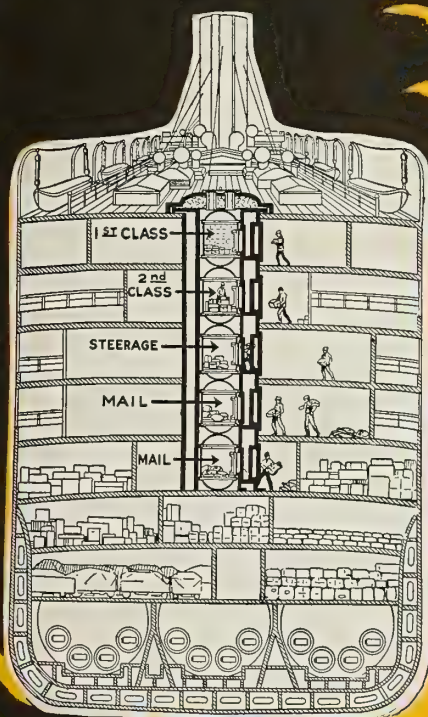
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cuts rust. It loosens rust-bound parts without the use of force and its attendant loss through breakage. It is a non-inflammable free-flowing liquid. It penetrates where the strongest tool cannot reach. It softens red or white lead, paint, tar, heat-hardened grease or carbon, and all without injury to metal, wood, cloth or the hands.

Its uses in the shipbuilding and repair yards, as well as on board ship are innumerable.

Order a can today and try it.

Satisfaction guaranteed or money refunded.

If your ship chandler does not have Rustsolvo in stock send your order direct to us.

Size	Gallon	Half Gallon	Quart	Pint
Price	\$6.00	\$3.25	\$2.00	\$1.00

The Rust Products Co. of America
64 East Lake St. Chicago.

Keep our Ships on the Seven Seas under the Stars and Stripes

Key number beside ship's name indicates operator shown bottom of column.

EUROPE

Plymouth, Boulogne and London

From New York

October 11—November 15—December 15—
Centennial State (159).

October 25—November 26—December 27—
Panhandle State (159).

Bremen and Danzig

From New York

November 5—December 24—Potomac (159).

October 22—December 10—Princess Matoika
(159).

October 15—December 3—Hudson (159).

Plymouth, Cherbourg and Bremen

From New York

November 1—November 29—America (159).

October 4—November 8—December 8—
George Washington (159).

SOUTH AMERICA

Rio de Janeiro, Montevideo and

Buenos Aires

From New York

October 1—Southern Cross (91).

October 15—Aeolus (91).

October 27—Huron (91).

FAR EAST

**Honolulu, Yokohama, Kobe, Shanghai,
Manila, Hongkong**

From San Francisco

October 1—Empire State (105).

October 11—Hoosier State (105).

November 12—Golden State (105).

December 17—Hoosier State (105).

**Yokohama, Kobe, Shanghai, Hong-
kong, Manila**

From Seattle

October 15—Keystone State (106).

November 26—Hawkeye State (106).

December 24—Hawkeye State (106).

**HAWAII, PHILIPPINES, EAST
INDIA**

**Honolulu, Manila, Saigon, Singapore,
Colombo, Calcutta**

From San Francisco

October 15—Wolverine State (105).

November 14—Granite State (105).

COASTWISE AND HAWAII

**Havana, Canal, Los Angeles, San
Francisco and Hawaiian Islands**

October 8—Buckeye State (80).

80 Matson Navigation Co.
120 Market St.,
San Francisco, Cal.
26 South Gay St., Baltimore, Md.
91 Munson Steamship Line.
67 Wall St., New York.
Tel. Bowling Green 3300.
105 Pacific Mail S. S. Co.
10 Hanover Sq., New York.
Tel. Bowling Green 4630.
621 Market St., San Francisco, Cal.
106 The Admiral Line.
17 State St., New York.
Tel. Bowling Green 5625.
L. C. Smith Bldg., Seattle, Wash.
159 United States Lines.
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Extensive Facilities for Ship, Engine, and Boiler Repairs



**OUR NEW TEN THOUSAND TON FLOATING DRY DOCK NOW READY FOR
BUSINESS!**

**CAPACITY OF SHIPYARD—EIGHT BUILDING WAYS, THREE LARGE WET DOCKS
ENGINE BUILDERS—BOILER MAKERS—IRON FOUNDERS**

**BUILDERS OF HIGH CLASS SINGLE AND TWIN SCREW PASSENGER AND CARGO
VESSELS, ALSO BULK OIL TANKERS, UP TO 600 FEET IN LENGTH**

SUN SHIPBUILDING COMPANY

Main Office and Shipyard

Chester, Penna., U. S. A.

An illustration of a ship's captain standing and a sailor kneeling. The captain is wearing a dark, double-breasted uniform with a peaked cap. The sailor is wearing a white uniform with a dark neckerchief and a cap, and is kneeling on the deck, holding a thick rope. The rope is coiled on the deck in the foreground.

THE CAPTAIN KNOWS

"Men who go down to the sea in ships" have, since 1824, been using a rope, light, strong, flexible and almost wear-proof, that is made in Plymouth.

Made in the early days to exactly meet the needs of the times, Plymouth Rope today possesses just a little more wear, a little more strength, a little more flexibility than do other ropes.

That is why the ship captains of to-day, like the captains of those famous ships of the first American Merchant Marine, prefer that their ships be equipped with Plymouth.

You too will find, as have these experts, that Plymouth is The Rope You Can Trust.

PLYMOUTH CORDAGE CO.

North Plymouth, Mass.
Welland, Canada

5-53



5-Step Clearance Control

now available on belt driven compressors requiring 100 H.P. or more

Graduated capacity control on belt driven air compressors.

The introduction of the XCB Air Compressor presents for the first time an efficient and graduated capacity regulation for belt driven air compressors.

The I-R 5-Step Clearance Control is admittedly the most efficient and simple air compressor regulation. For years it has been standard on our large direct connected electric driven compressors. Now it can be furnished on belt driven units as small as 100 H. P.

The unloading is entirely automatic.

The demand for air is seldom steady throughout the day. With the 5-Step Clearance Control the Compressor automatically operates at *full, three-quarter, one-half, one-quarter, or no load* as required to maintain the desired air pressure.

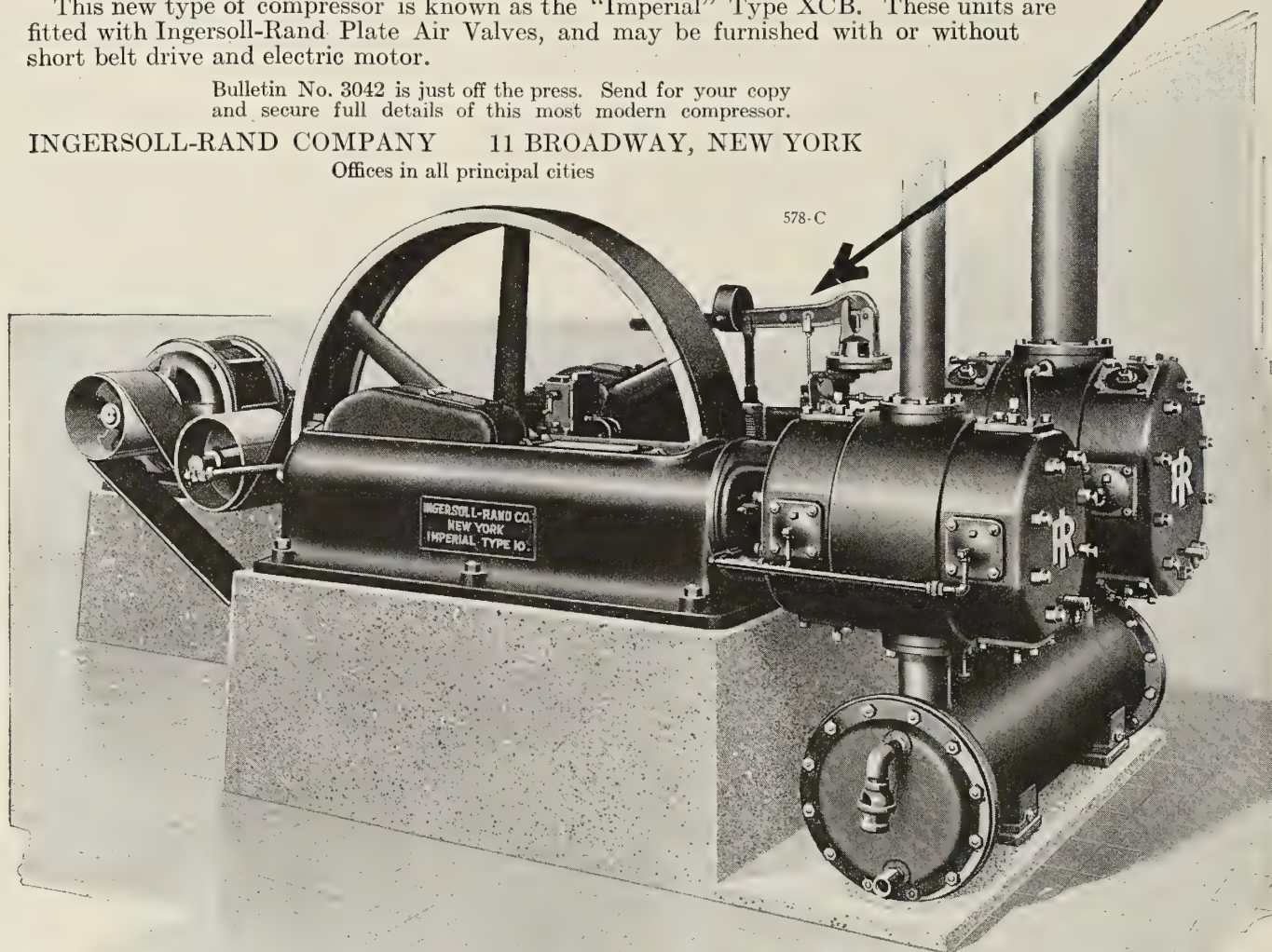
Guarantees efficient operation at partial loads.

The reduction in power secured with this method of control is practically in direct proportion to the quantity of air produced.

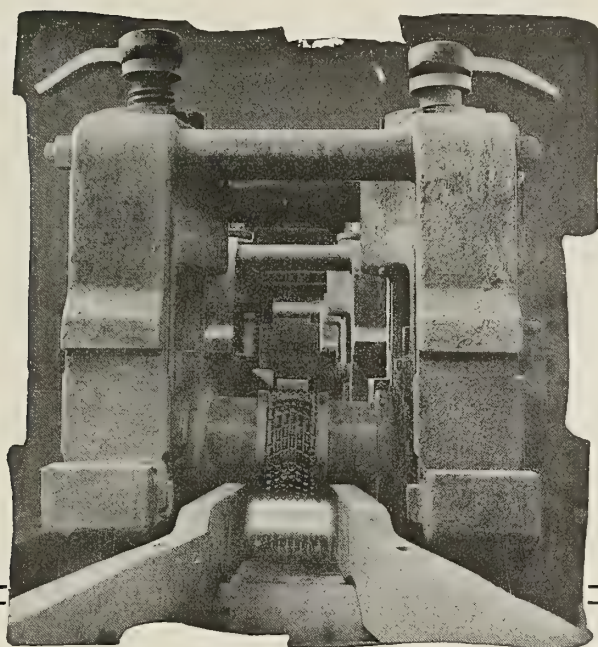
This new type of compressor is known as the "Imperial" Type XCB. These units are fitted with Ingersoll-Rand Plate Air Valves, and may be furnished with or without short belt drive and electric motor.

Bulletin No. 3042 is just off the press. Send for your copy and secure full details of this most modern compressor.

INGERSOLL-RAND COMPANY 11 BROADWAY, NEW YORK
Offices in all principal cities



Ingersoll-Rand



Spellerizing rolls, showing bloom being roll-knobbed to make the metal for "NATIONAL" Pipe more resistant to any tendency to corrosion.

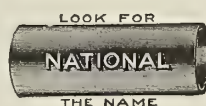
Spellerizing "NATIONAL" PIPE

to give added durability for marine service

WHEN PIPE METAL IS UNIFORM THROUGHOUT there is less tendency to corrode, or to deteriorate through other causes; therefore, the metal for "NATIONAL" Pipe is made by processes which give the utmost uniformity.

Spellerizing (mechanical roll-knobbling) is one of the special processes employed to give a uniformly dense, fine-grained surface texture to all "NATIONAL" Pipe, sizes 4-inch and under, and thereby reduce any tendency to galvanic action (corrosion). This feature makes "NATIONAL" Pipe especially desirable for Marine Service, where conditions affecting piping are particularly severe in many cases.

Ask for a copy of "NATIONAL" Bulletin No. 9

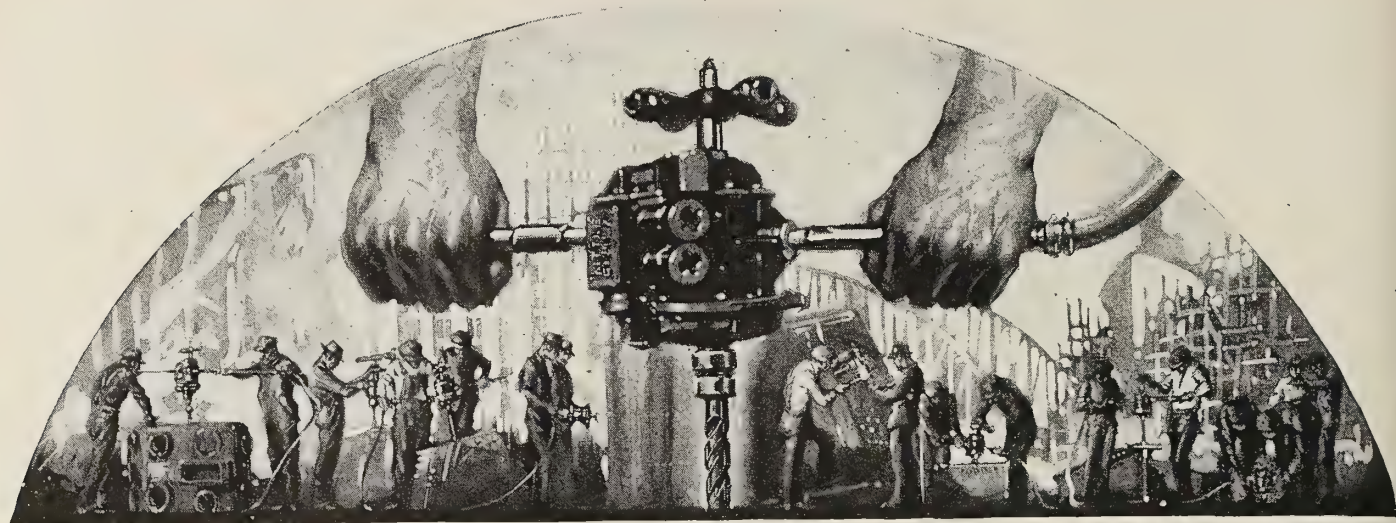


NATIONAL TUBE COMPANY, PITTSBURGH, PA.

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What one of the World's Largest Air Drill Users just found out

NINE months ago one of the largest pneumatic tool users in the world — a prominent ship-builder — decided to satisfy itself concerning the relative economy and operating advantages of various makes of portable air drills.

Three makes of air drills including the Little Giant were selected for this test. All drills were operated under identical service conditions for nine months.

Tests to determine horsepower, drilling speeds and air economy were made at

the end of the nine months. These tests, plus accurate records kept during the period, proved the following:

That Little Giant Air Drills were the most economical because they

- consumed less air per foot-pound of work done.
- had better speed characteristics.
- had greater spindle torque from speed-light to stalling point.
- or in other words developed greater horse-power under every condition of load.

Let a C-P Service Engineer prove the above statement. Or, better yet, make the same test in your own plant with one or a number of Little Giants applied to the definite work which such tools perform, under your own requirements.

Little Giants are built in a complete line for every drilling, reaming, tapping, screw-setting, nut-and-bolt tightening or other shop requirements. Address the nearest Branch for Engineering Service. Also ask for Bulletin 598.

Chicago Pneumatic Tool Company

Chicago Pneumatic Building • 6 East 44th Street • New York

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P 115

BOYER PNEUMATIC HAMMERS • LITTLE GIANT PNEUMATIC AND ELECTRIC TOOLS
CHICAGO PNEUMATIC AIR COMPRESSORS • VACUUM PUMPS • PNEUMATIC HOISTS,
GIANT OIL AND GAS ENGINES • ROCK DRILLS • COAL DRILLS

LITTLE
The World's Standard



GIANT
Air Drill

—LESS TAPS—
MORE HOLES PER TAP
WHEN
BRUBAKERS
ARE USED

BRUBAKER quality is not a matter of chance—it is a scientific certainty, every time.

Special machinery insures accurate pitch and correct relief. Improved methods of heat treating mean uniform and serviceable temper.

Then thorough inspection practically eliminates the possibility of defective taps getting into stock.

That's why Brubaker Taps tap 20% more holes per tap—cut faster and cleaner than the average tap. Your next requisition specify "Brubaker."

W. L. BRUBAKER & BROS. CO.
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NEW YORK

Factory at Millersburg, Pa.





Pick it up and carry it the Yale Way

THIS Yale E-P 60 Electric Industrial Truck, elevating platform type, in use on one of the large New York City steamship piers, is handling live skids loaded with sacks of coffee; *and saving money every trip.*

One unskilled operator with a Yale E-P 60 Truck easily picks up any load up to 4000-lbs. and transports it at speeds up to 6 miles per hour to any desired point.

You can use the same efficient method in your establishment, whether steamship pier, freight terminal or manufacturing plant. It is the Yale Way—the modern,

economical system of handling materials with the least expenditure of costly man-power.

You will find Yale Electric Industrial Trucks exceptionally efficient and economical as a means of yard and interplant transportation.

Other Yale Way units include Yale Tractors and Trailers; Spur-Geared, Screw-Geared and Differential Chain Blocks; Electric Hoists and Trolley Systems.

Ask for complete information. Yale engineers will be glad to investigate your plant conditions and make recommendations.

Yale Made is Yale Marked

The Yale & Towne Mfg. Co.

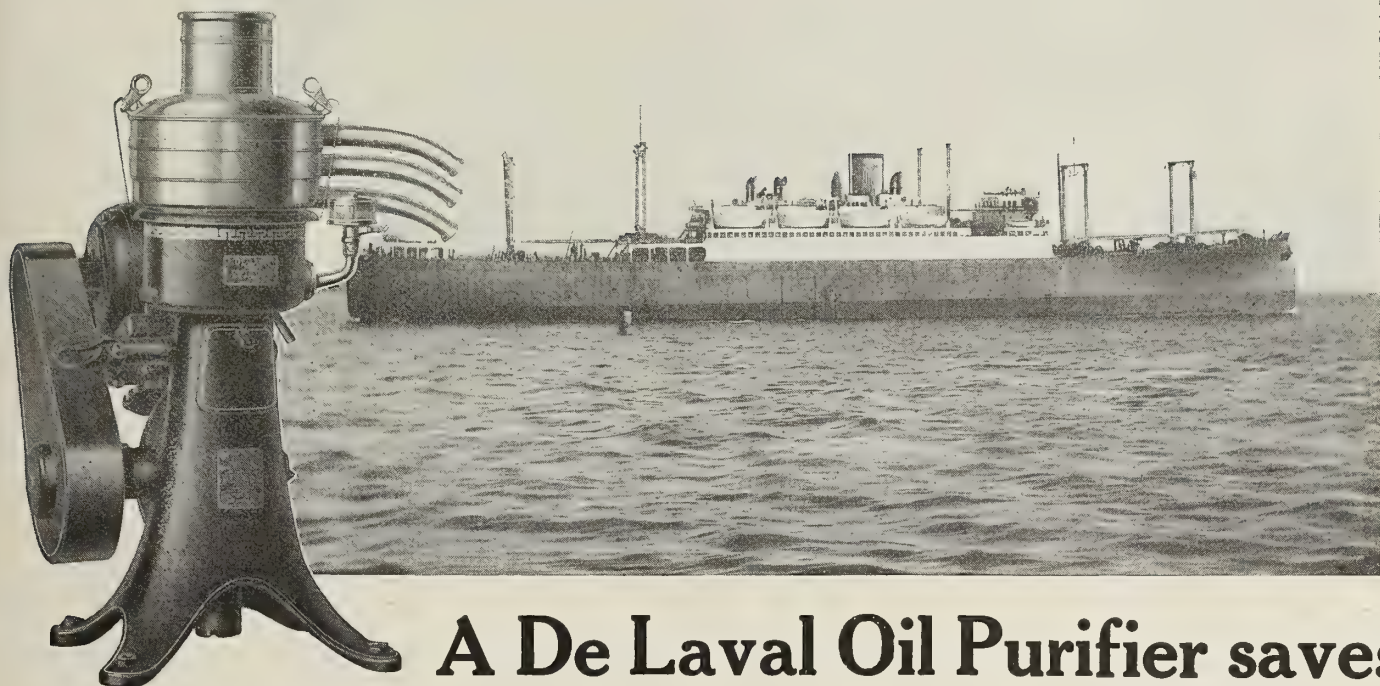
Makers of Yale Products: Locks, Hoists
and Electric Industrial Trucks

Stamford, Conn., U. S. A.



Hoisting and Conveying Systems

*The S. S. Hawkeye State
—one of more than 700
vessels equipped with De
Laval Oil Purifiers.*



A De Laval Oil Purifier saves oil and protects machinery on the Hawkeye State

De Laval Oil Purifiers save oil by making it unnecessary to ever pump a drop of it overboard. Once through the De Laval, the dirtiest oil is completely purified and is ready for another period of use—free from water, dirt and particles of metal. Emulsions readily yield to De Laval centrifugal purification so that this worst enemy to efficient lubrication is eliminated.

De Laval Oil Purifiers protect machinery, because they make it easier and cheaper to

use clean oil than to use that which has become foul through use. Bearing trouble is reduced to the minimum; gears run smoother and last longer. And on the Diesel-driven ship corresponding savings can be made by centrifugally purifying crank case oil.

Bulletins Nos. 102 and 103 describe the De Laval Oil Purifier in detail and tell how you can get better lubrication at less cost. Write for them today.

The De Laval Separator Company

Largest Manufacturers of Centrifugal Machinery in the World

New York, 165 Broadway

Chicago, 29 East Madison St.

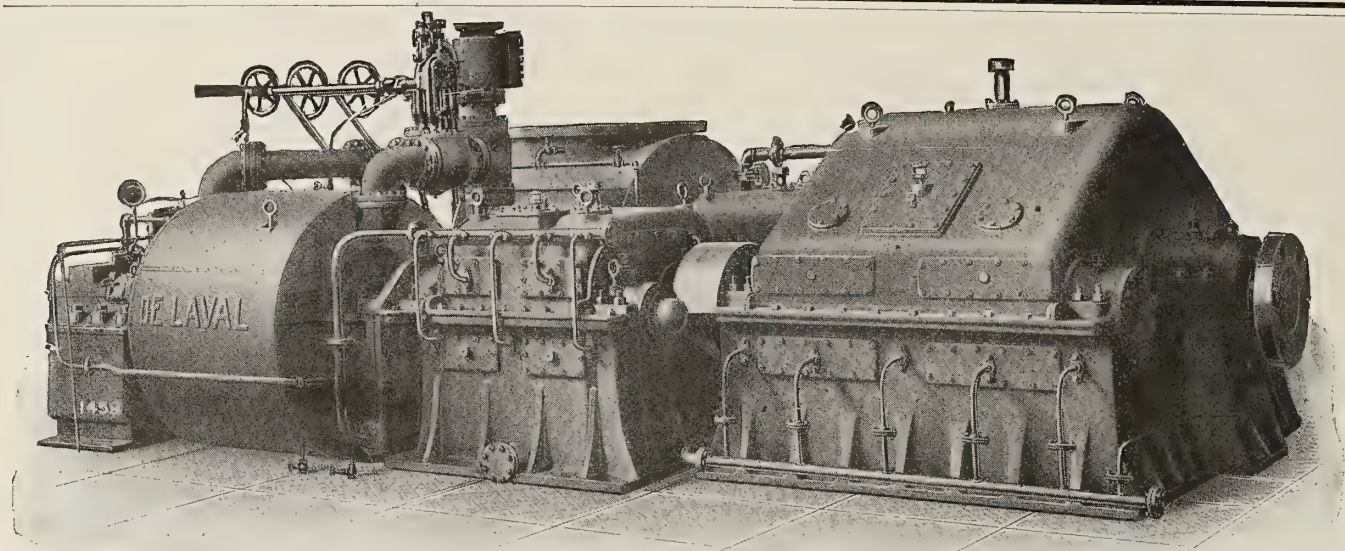
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De Laval Steam Turbine Company
Trenton, N. J.

De Laval Pacific Company
San Francisco, Cal.

Chadburn's (Ship) Telegraph Company, Ltd., Cyprus Road, Bootle, Liverpool
Turbine Equipment Company, Toronto, Ontario, Canada

Sooner or later you will use a De Laval

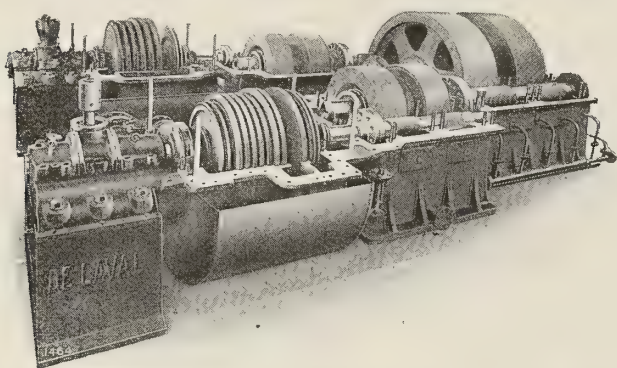


De Laval 3,300-hp. compound, double-g geared marine turbine; turbine speed 3,200 r.p.m.; propeller speed 90 r.p.m.

You Can Get More Speed From The Same Boilers With Less Fuel By Installing De Laval Geared Turbines

FIVE 10,500-ton tankers were recently refitted with De Laval Compound turbines and double-reduction gears. The substitution of De Laval geared turbines for the original equipment made it possible to raise the speed materially without any increase in boiler or condenser capacity. Compared with similar vessels driven by reciprocating engines, approximately a knot and a half greater speed is obtained from 10 per cent less total steam.

De Laval turbines are of the impulse type, with large clearances, and can be quickly reversed, permitting rapid and easy maneuvering. An interlocking gear prevents admission of steam to both ahead and astern turbines at the same time.



De Laval 3,300-hp. double-g geared marine turbine, with casing covers removed.

Over 2,000,000 hp. of De Laval gears are giving satisfactory service. De Laval gears are practically noiseless in operation, which is not only an indication of perfect cutting, high efficiency and long life, but also is necessary for proper attention, since trouble in machinery is most often detected by hearing.

Our engineers will be glad to submit further details upon receipt of particulars relating to proposed installations.

De Laval

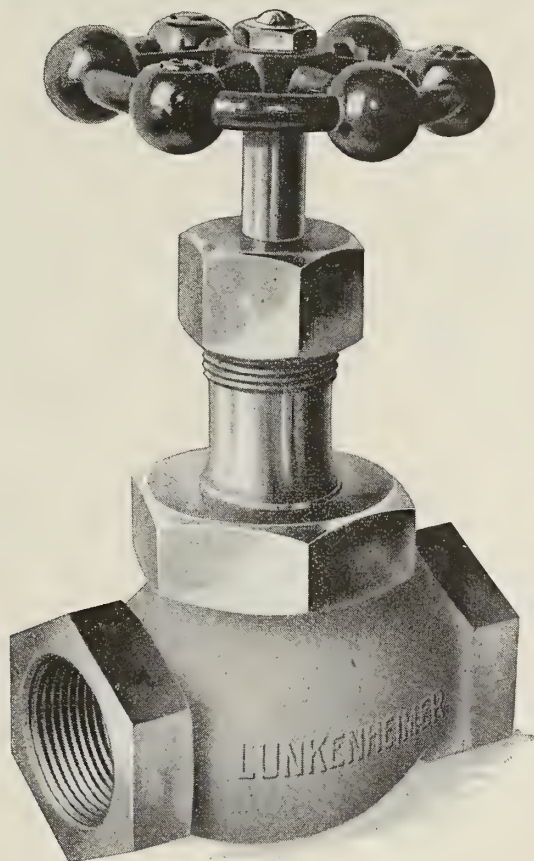
Steam Turbine Co.

TRENTON, N. J.



LUNKENHEIMER

Regrinding Valves



Lunkenheim Regrinding Valves have firmly established their unparalleled merit by the successful results they have given in Marine service.

The metal to metal seat—ground to a tight fit, forms the ideal seating surface to resist the wearing action of steam at high velocity. And the fact that the seating surfaces can be reground (an inexpensive operation easily accomplished), makes the renewal of parts wholly unnecessary.

Their extreme durability due to correctly proportioned parts, high quality materials and expert workmanship insures economy in maintenance.

Globe, Angle and Cross, and Horizontal, Angle, Vertical and Swing Check Patterns.

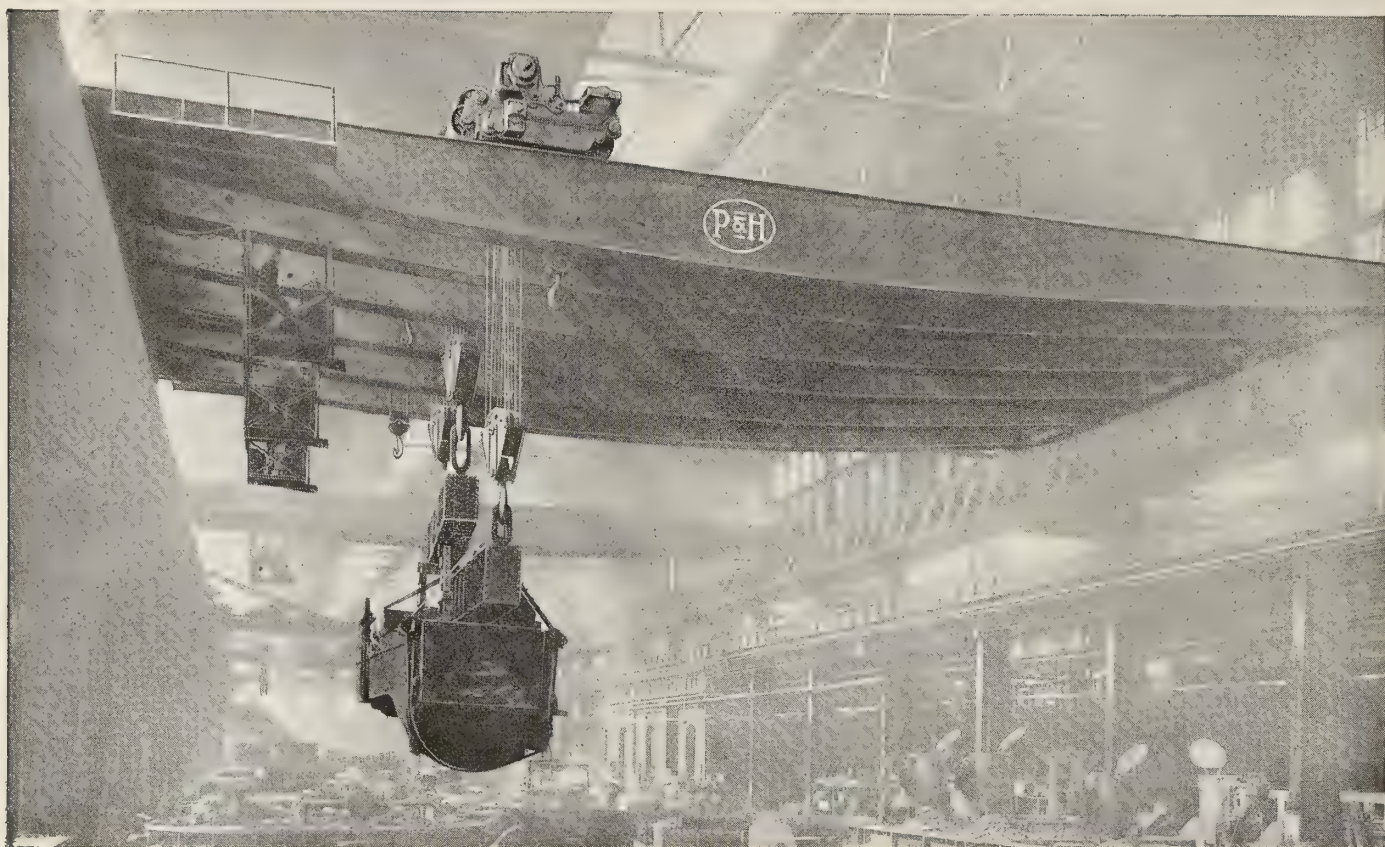
Distributors of Lunkenheim Products, situated in practically every port, carry stocks for immediate delivery. Specify LUNKENHEIMER and insist on getting what you specify.

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LARGEST MANUFACTURERS OF
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No 58
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Three P & H Cranes conveying monster engine bed casting after being raised from mould.

LIFTING A 225-TON LOAD

At a signal from the floor man, the crane operators moved their controllers,—crane slings and hoisting cables tightened. Then from the dark depths of the cavernous mould, shaken from the grip that held it, came the huge casting of an engine bed.

Monster weight that it was, the three P & H Cranes raised it gently aloft, working smoothly and precisely. The gentle hum of the electric motors, the quiet running of the cut tooth steel gears, the free travel along the runway, gave little hint of the bigness of the job being accomplished.

These Cranes have been in continuous service for 16 years

The combined rated capacity of the three P & H Cranes used to handle this unusual load was only 160 tons; two being of 60-ton capacity and one of 40-ton. They are three of a dozen that have been operating continuously in this foundry for 16 years.

The load, equivalent in weight to a six-story, 25 x 50 foot office building, was handled with ease by the three P & H Cranes.

Such is the crane service your plant should have,—a result of P & H standards since 1884.

Crane and Hoist Division

PAWLING & HARNISCHFEGER CO.

In Milwaukee Since 1884

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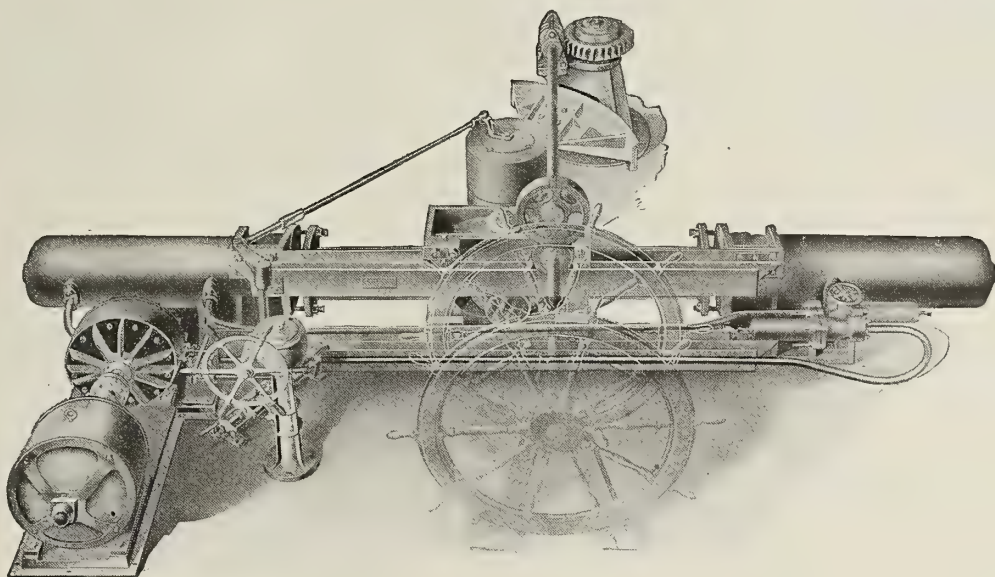
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CRANES
ELECTRIC TRAVELING

SUITABLE FOR ALL BOATS ^{A N D} SHIPS

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THE A-E-CO ELECTRO-HYDRAULIC STEERER

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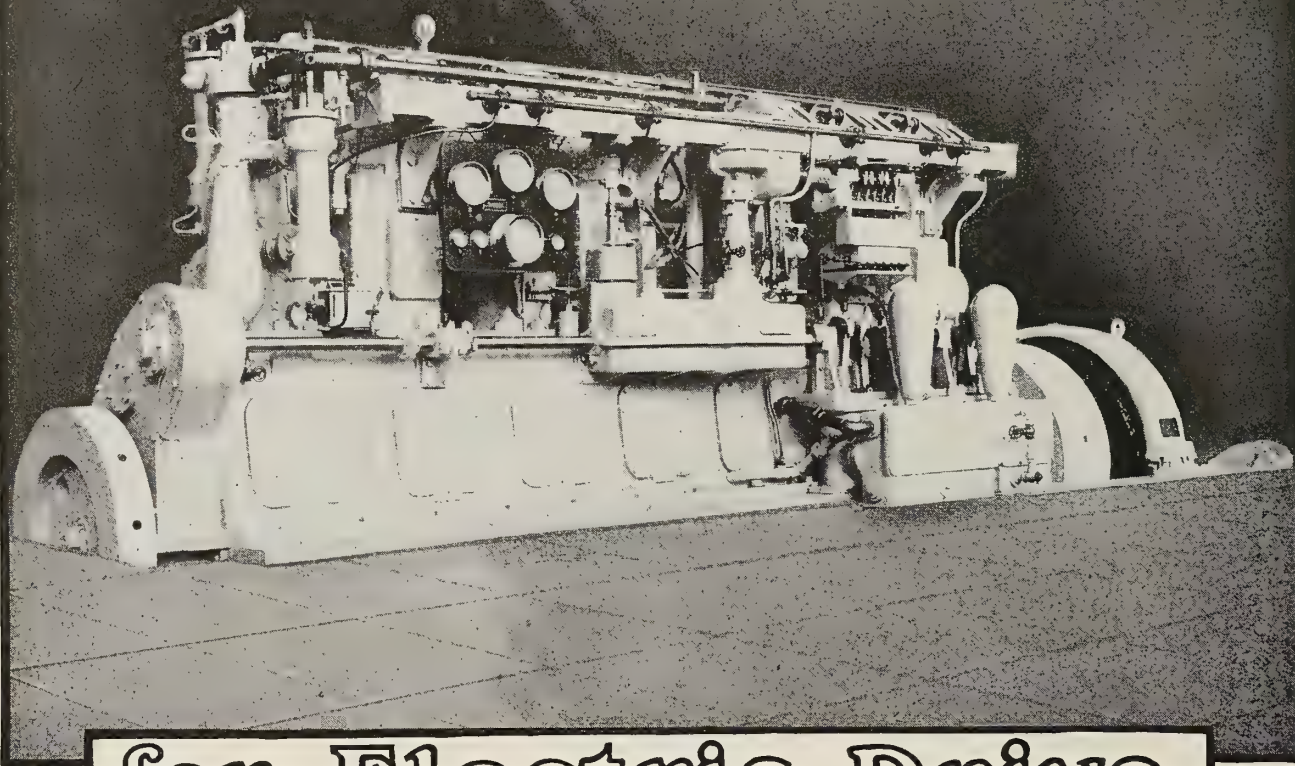
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AMERICAN ENGINEERING COMPANY
PHILADELPHIA

Winton Oil Engines



for Electric Drive

AN increasingly large number of Winton Diesel-Electric Drive Installations are being made, because these outfits are proving out in service to be splendidly efficient and extremely economical in operation.

A series of two or more Winton Oil Engines, each connected to a Westinghouse Generator, generating power and supplying it to a driving motor located in the stern, makes an ideal installation for many different types of ships. The power plant can be placed advantageously, it occupies less room than any other type of propulsion unit and requires a minimum of attention and labor. Its fuel is low in cost, easily stored and quickly taken aboard.

Write to-day for full details of Winton Diesel-Electric Drive Units and for the new Winton Catalog

WINTON ENGINE WORKS, CLEVELAND, OHIO, U. S. A.

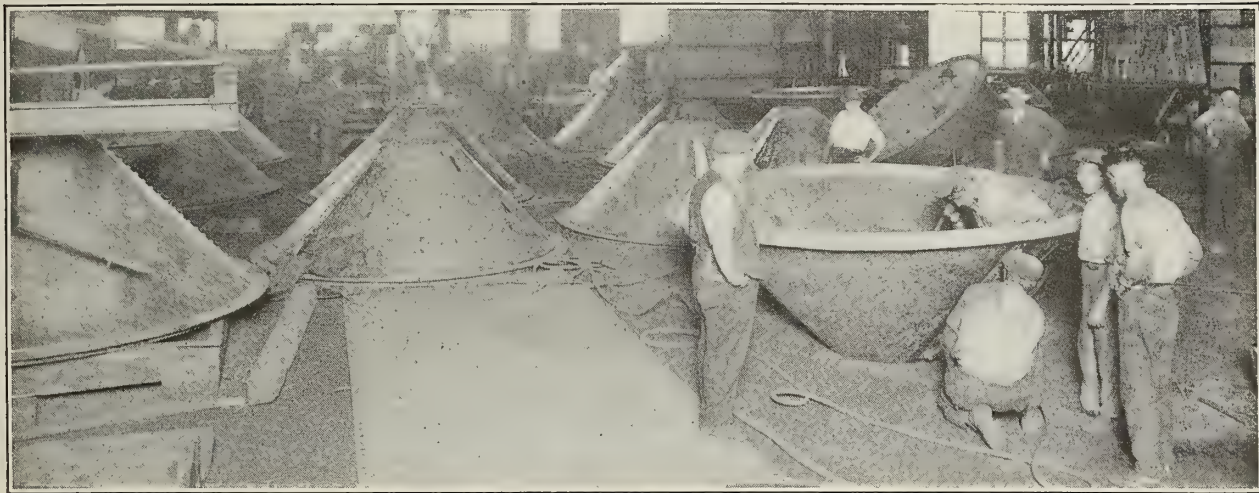
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PERHAPS no industry has made greater advancement in the last half century than shipbuilding.

Dating back to the earliest days of steel shipbuilding in this country, the Merchant Yard was the first yard to build iron ships, and has advanced with the industry. All of its undertakings are governed by experience.

This experience, our modern equipment, and the services of our specialized technical staff are at the disposal of those who are in the market for ships, general engineering work, and our various specialties in steel structures as listed.

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Chester, Pa., or 39 Broadway, New York

**Ask us to bid on
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Designs ready for Tankers of 10,000 D. W. T. All kinds of ships up to 15,000 D. W. T. Motorships 11,500 D. W. T. with Diesel Engines. Conversion of Steamships to Diesel Motorships with Direct or Electric Drive. Repairs and Reconditioning of Ships.

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With Scotch marine boilers it has been customary to consider re-boiling necessary at least once during the ship's useful life and in some cases oftener.

The cost of the first set of water-tube boilers is usually the final cost. This cost is not only less than the first cost of Scotch boilers, but it saves the expense of laying up a ship for a long period during its useful life to renew boilers as well as the cost of the new Scotch Boilers.

The life of marine boilers is dependent on design and operation. The design of Scotch boil-

ers is a fundamental cause of short life as its lack of circulation produces strains which promote leakage and result in constant caulking, finally making new boilers necessary. The design of most water-tube boilers insures rapid circulation, even temperature of all parts of the boiler and no wear of essential parts due to caulking, tube rolling, etc., therefore, their useful life is in many cases longer than the ship.

Foster Marine Boilers are correctly designed for a long life with minimum repair costs.

The Foster Catalogue shows why this boiler has a long life.

FOSTER MARINE BOILER CORPORATION

General Offices:

111 BROADWAY, NEW YORK

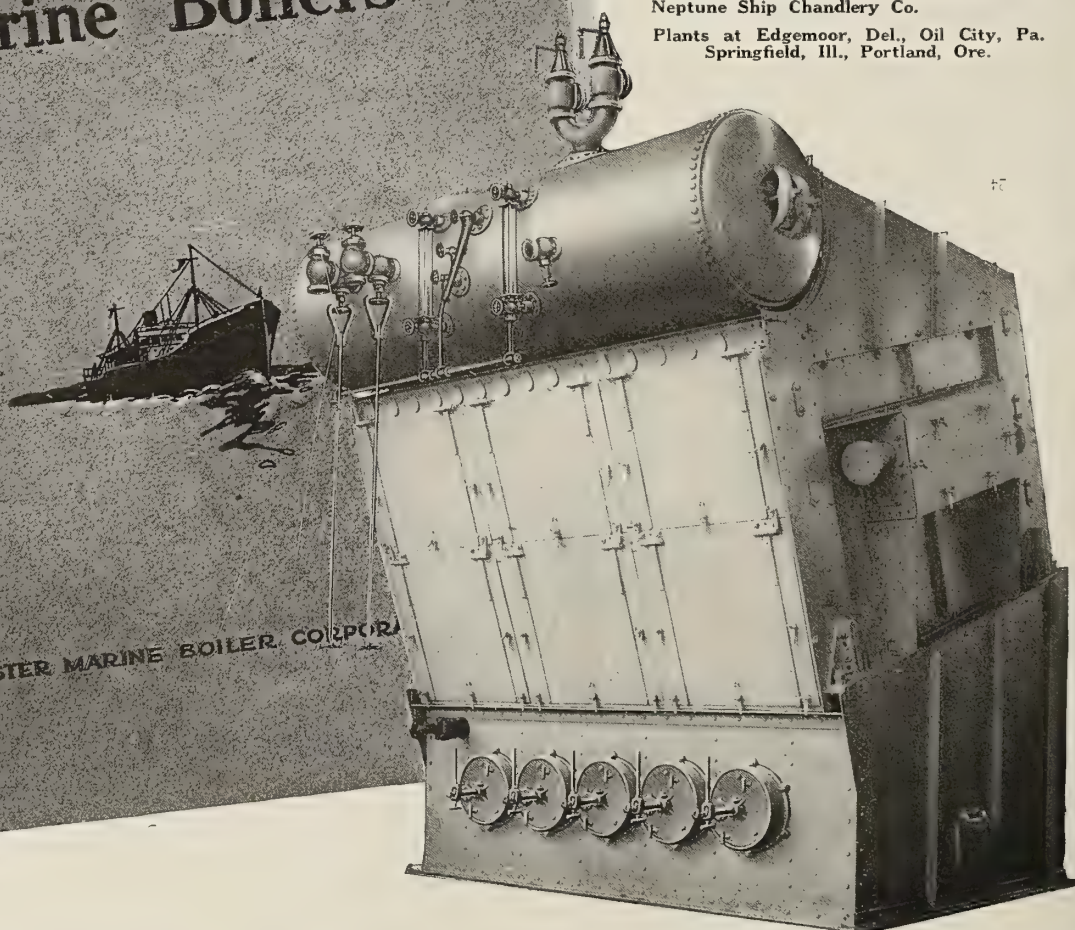
Branches: Boston, 50 Congress St.; Pittsburgh, Oliver Bldg.; Philadelphia, Land Title Bldg.; Chicago, Harris Trust Bldg.; San Francisco, Balboa Bldg.

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Plants at Edgemoor, Del., Oil City, Pa. Springfield, Ill., Portland, Ore.

FOSTER Marine Boilers

FOSTER MARINE BOILER CORPORA



FALK

HERRINGBONE GEARS



A MARINE GEAR SERVICE

Unexcelled plant facilities and years of experience in designing and building reduction gear units of every type have established The Falk Corporation as consulting authorities for marine engineers of repute.

Falk Herringbone Marine Reduction Gears long since proved their superiority for dependable economical service on the high seas. The fact that they are invariably specified by builders who have previously installed them is proof positive.

Our marine engineering department is always at your service.

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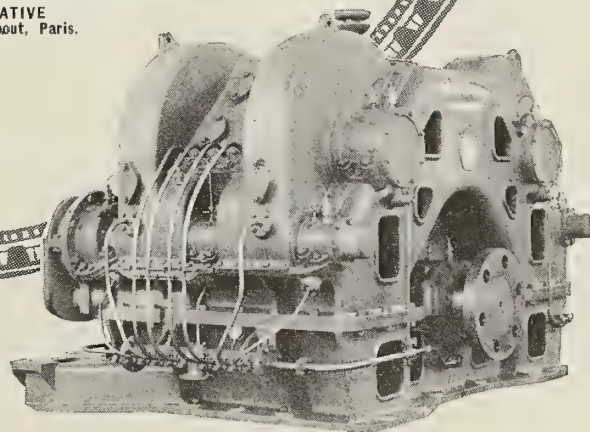
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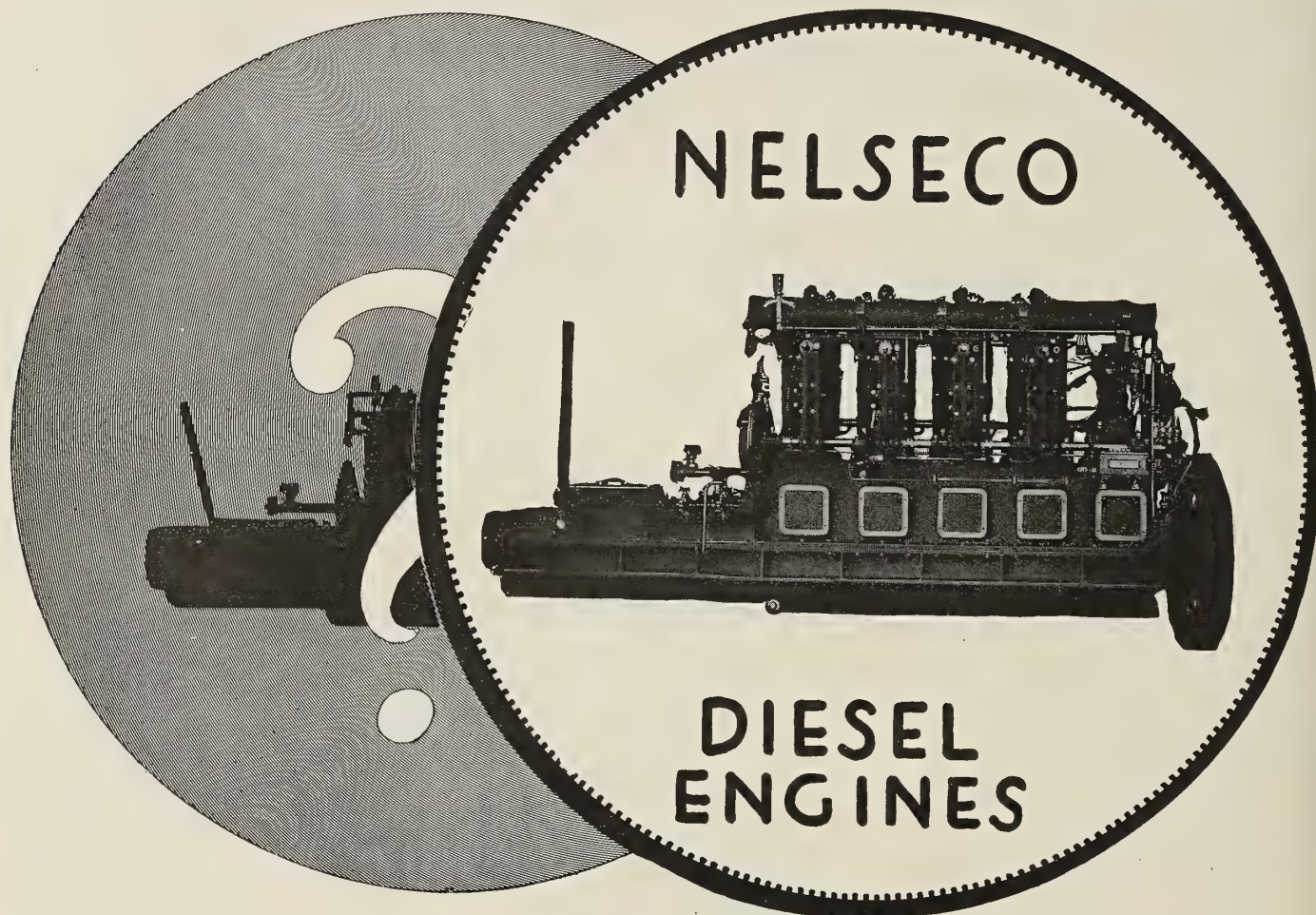


"Hawarden" — equipped with Falk 2800 H.P. Herringbone Gear Unit. Falk Gears are accurately hobbled from solid steel blanks cast in our own acid open-hearth foundry.



Falk 2800 H.P. Marine Gear Unit. Falk Units are furnished in single or double reduction for compound Turbines and in single reduction for Diesel Type Marine Engines.

BARGAINS IN DIESEL ENGINES



Certainty—

THE SHADOW OF DOUBT
NEVER ENTERS THE MIND OF USERS
OF
NELSECO
MARINE DIESEL ENGINES

In order to move our present stock of engines we are prepared to make a substantial reduction from our regular price. For early delivery.

Ships thus equipped are propelled efficiently and dependably with as low fuel consumption as is possible to secure through any like operation. Over 150,000 H. P. now in service in American and Foreign Vessels or on order.

Sizes: 120, 180, 240, 360, 480 to 2000 B.H.P.

NEW LONDON SHIP & ENGINE CO., Groton, Conn., U. S. A.

What Do You Know About Cooling Lubricating Oils?

A Booklet You Should Read

WHAT is the best method to employ in the cooling of the oil in bearings, reduction gears, etc., of large turbines aboard ship?

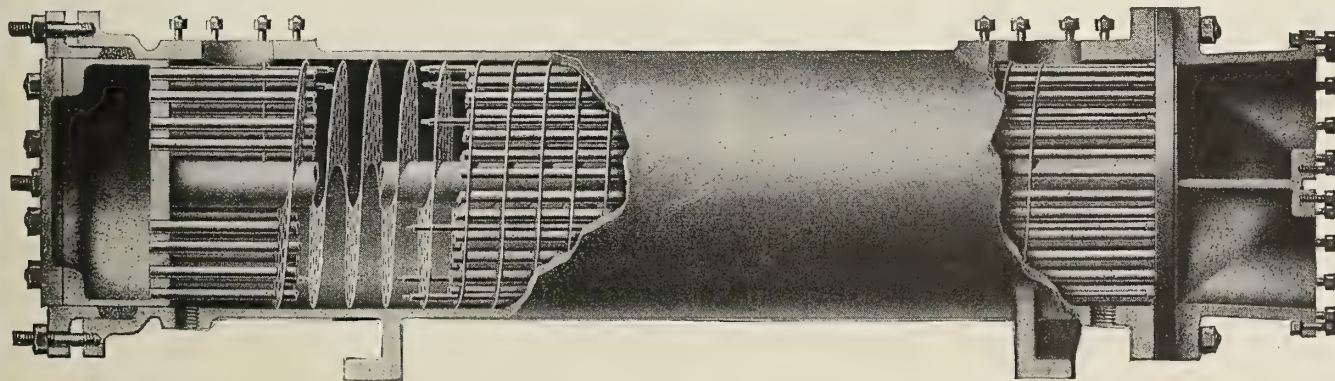
DO you know that a given quantity of oil can be used over and over again if the proper cooling medium is employed?

THESE points and many others are discussed and much other information intelligently presented in Bulletin No. 903, recently issued by The Griscom-Russell Co., 2124 West Street Building, New York. Any shipowner, operator, or executive can obtain a copy free of charge by writing for it on his own or his company's letterhead.

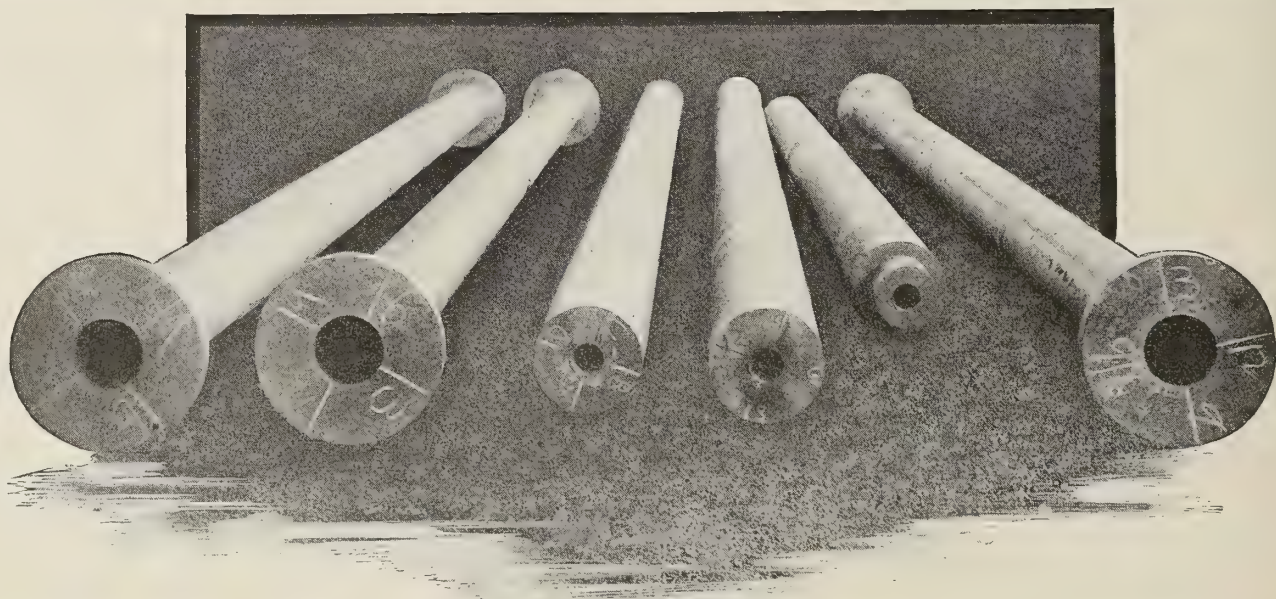
A DISTINCTIVE feature of the Multi-whirl Cooler is the patented helical baffle which directs the oil in its flow through the shell. Its advantages are as follows:

(1) Tube bundle removable—facilitating inspection and cleaning. (2) Tubes expanded into tube plates—no sweated joints. (3) Floating head construction—no expansion strains on tube joints. (4) Outside packed head—this construction eliminates any possible leakage of water into oil through faulty packing. (5) Compactness of unit—this is permitted by the high rate of heat transfer secured in the Multi-whirl Cooler. (6) Installation in any position—the Multiwhirl Cooler may be installed in any position with equal efficiency.

OVER 1600 Multiwheel Coolers are installed and in daily operation on ships throughout the world.



POLLAK



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Bars and Shapes for
Lockers, Shelving, etc.**

**Concrete Reinforcing
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Naval construction has made tremendous strides in recent years toward the "perfect ship"; American skill has triumphed again and again.

Hundreds of integral parts combine to produce the security and service of the modern ship.

The one avenue of power from the turbines, motors or engines is the propeller shaft, the vital artery of power transmission.

Every Pollak propeller shaft is made with a full realization of what is required of it, and made to meet the requirements.

One reason Pollak forgings have maintained continually a record for "Service that actually serves."

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Westinghouse



The World's First Diesel-Electric Cargo Ship

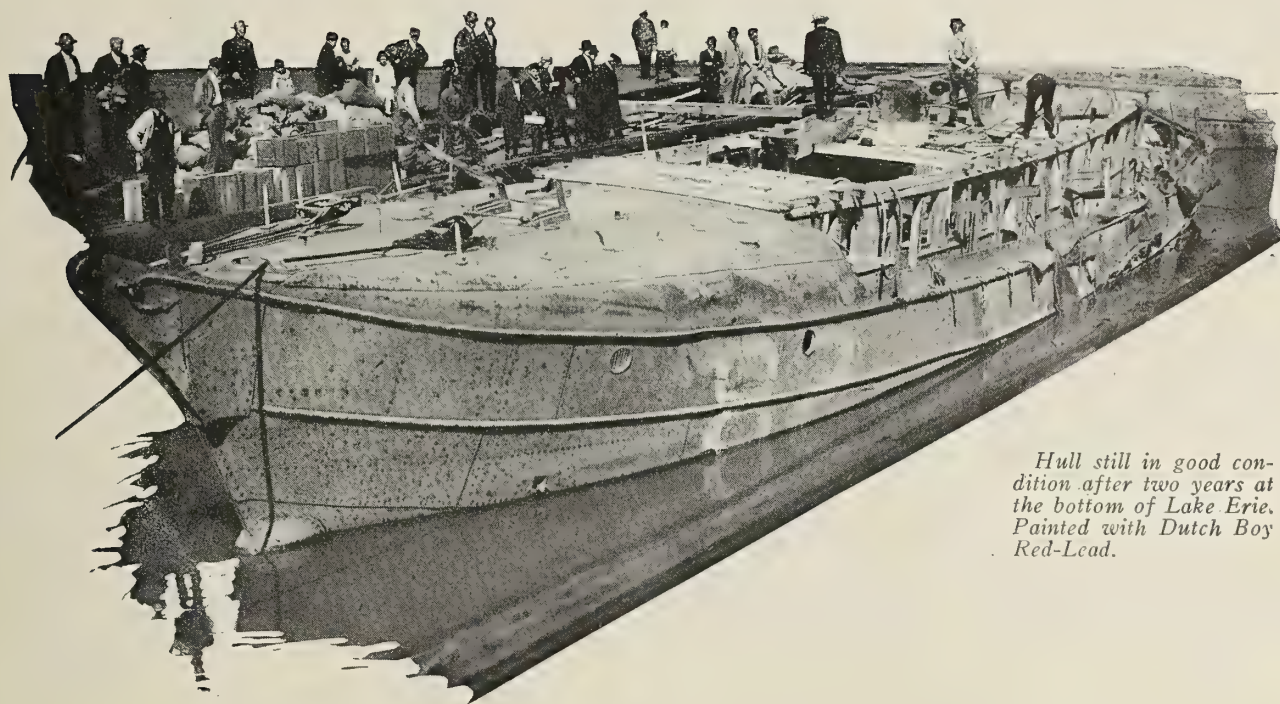
THE reliability and efficiency of Diesel engine-electric drive will soon be further demonstrated on the 2,200 dead weight ton "Fordonian" to be the world's first Diesel-electric cargo ship, now having its Diesel-direct drive replaced by Diesel-electric drive at the Tebo Yacht Basin of the Todd Shipyards Corporation.

The General Electric Company with its many years experience in the marine field was the first to successfully apply Diesel-electric propulsion to ships. The electric equipment for the 150-foot fishing trawler "Mariner" was furnished by this Company and has been in service since February, 1920.

Diesel engine-electric drive with G-E electric equipment was chosen for the "Fordonian" because of its high overall economy, saving in hull space, ease and flexibility of control, and reliability.

The General Electric Company supplies generating and control apparatus, propulsion motors, and motors for engine room and deck auxiliaries of every kind for Diesel-electric ships.

General  Electric
General Office Schenectady, N.Y. **Company** Sales Offices in all large cities



Hull still in good condition after two years at the bottom of Lake Erie. Painted with Dutch Boy Red-Lead.

Red-lead is cheaper than ship's plates

It costs a great deal less to put on a coat of Dutch Boy Red-Lead than to build a new ship. In fact, the cost of painting would be absorbed in a few days extra life of the ship.

Every vessel should have two or three good coats of red-lead while she is building, with plenty of time allowed for drying. This is particularly important for underwater parts.

Special topcoats may be necessary for special purposes, as in water and ballast tanks, but the priming coat should always be red-lead.

In the Navy "red-lead is the protective paint commonly used on metal surfaces" (to quote from

The Bluejacket's Manual) because it gives the best protection against the destructive action of salt water.

Dutch Boy Red-Lead meets Navy specifications for purity—freedom from litharge. It doesn't harden in the pail. No red-lead is wasted; no time lost by the painter.

Dutch Boy Red-Lead has the added advantage of greater spreading power than other paints for marine use. It covers the steel with a tough, elastic, uniform coat that won't peel or scale.

Specify Dutch Boy Red-Lead for all metal surfaces. Can be tinted to various dark colors as desired for finishing coats.

Write for Painting Helps No. 6.



"Save the surface and you save all"—Paint & Varnish

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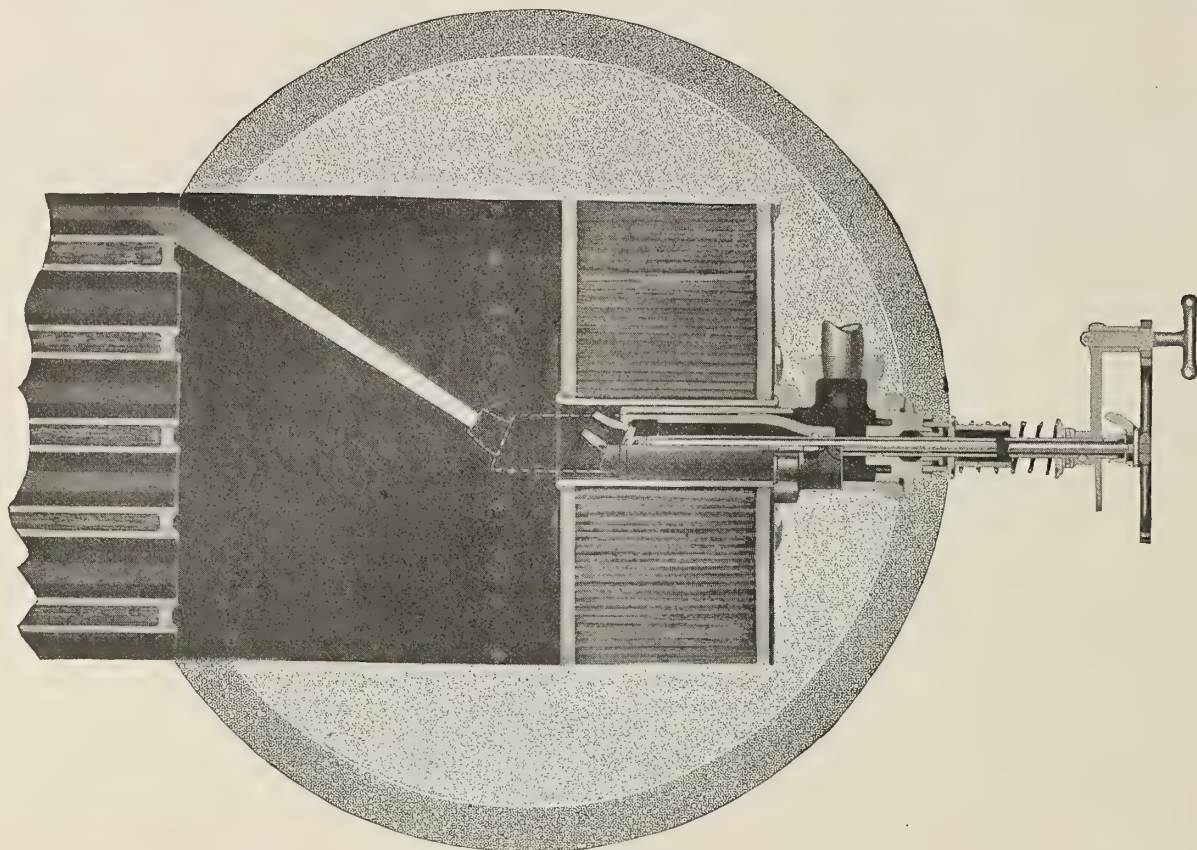
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Dutch Boy Red-Lead



SOOT REMOVAL FROM SCOTCH MARINE BOILERS

is effectively accomplished by the improved Diamond Rear End Blower (Model B).

And soot removal is essential to economy. Power is one of the largest items of expense in the cost of operating a vessel, and the cost of fuel represents on the average 70 per cent. of the cost of power. The presence of soot has cost—it still costs—a loss of hundreds of thousands of tons of coal and hundreds of thousands of barrels of fuel oil a year to ship owners. Soot waste has been eliminated on many ships, and it can be eliminated on all with a consequent notable increase in boiler efficiency and a consequent great increase in marine profits.

Thousands of Diamond Model B Blowers are in use today on Scotch Marine boiler. The blower is permanently installed through the rear water leg, a hole being cut in the plates and a section of tubing expanded and beaded into place. The blower is encased in this tubing. When not in use the blower is secreted in the casing. As the steam is turned on the nozzle is automatically forced forward into blowing position. In operation dry steam is shot into each tube with the draft at a terrific velocity, sweeping and scouring the soot from the full length of the tubes.

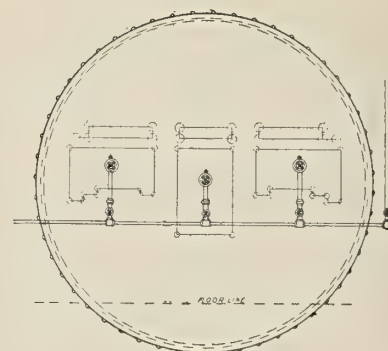
Diamond Soot Blowers save fuel and labor. Write for full information on blowers for any type of boiler, requesting your copy of Bulletin 134, "How Some Ship Owners Have Increased Their Profits."

(New York Address, 90 West St.)

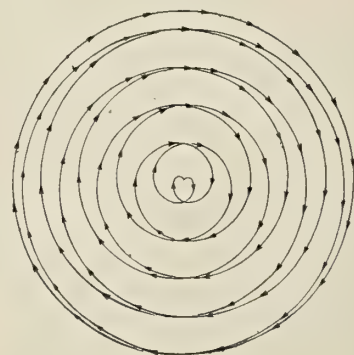
DIAMOND POWER SPECIALTY COMPANY
Detroit, Michigan

Diamond

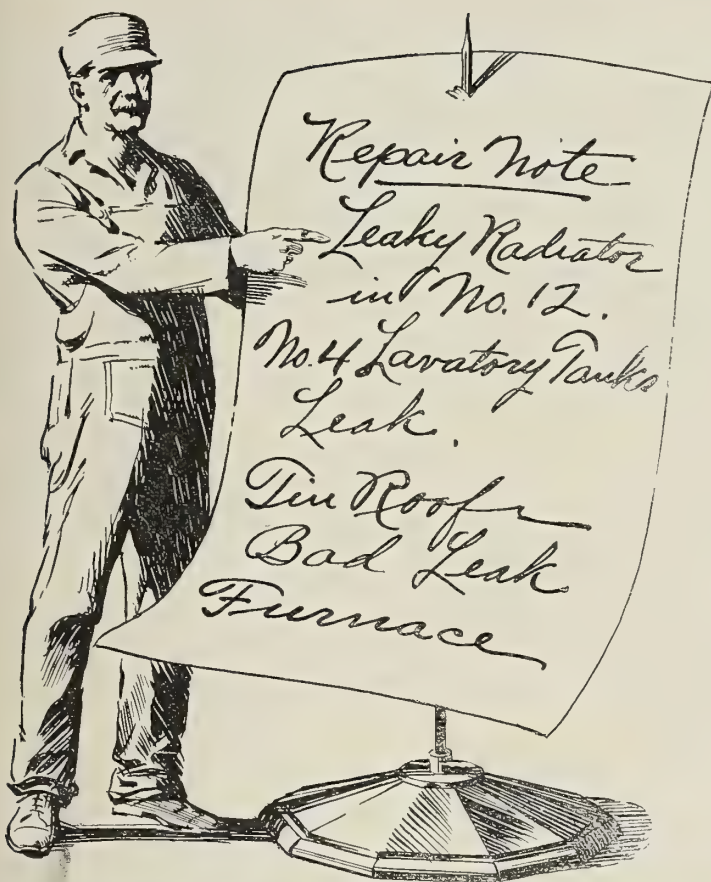
SOOT BLOWERS - SAVE 4 to 8% FUEL



*Method of installing Model B blowers
on a three-furnace Scotch boiler.*



*The arrows show the course of the
steam jet as it travels over the tube
sheet, blowing every tube.*



Smooth-On Iron Cement will make any of these repairs quickly and permanently.

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REG. U. S. PAT. OFF.

Don't wait for leaks to become serious and cracked parts to split wide open. Get your can of Smooth-On Iron Cement—and go to it.

Mix the Smooth-On with a little water until it is like putty and apply it like putty. Soon the Smooth-On will metallize and as it metallizes it expands. It becomes an actual part of the metal to which it is applied and expands and contracts evenly with it. Nothing can dislodge Smooth-On Iron Cement; it's there to stay.

For all kinds of engine, boiler room and general repairs Smooth-On Iron Cement is indispensable.

Instruction Book No. 18 will help you a lot. Your copy is waiting.



Leaky Skylights

Clean the loose putty from the frame, then apply Smooth-On Iron Cement No. 6—an Iron Putty, unequalled for metal skylights.

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293

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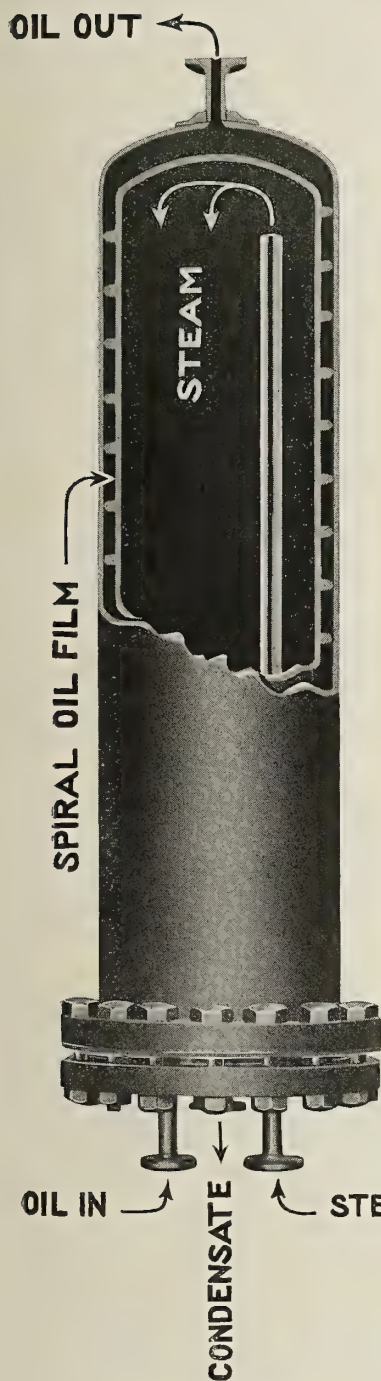
THE LATEST in OIL HEATERS

Cleanable
Pressed Steel Shell Construction
Joints,—one outside, none inside,
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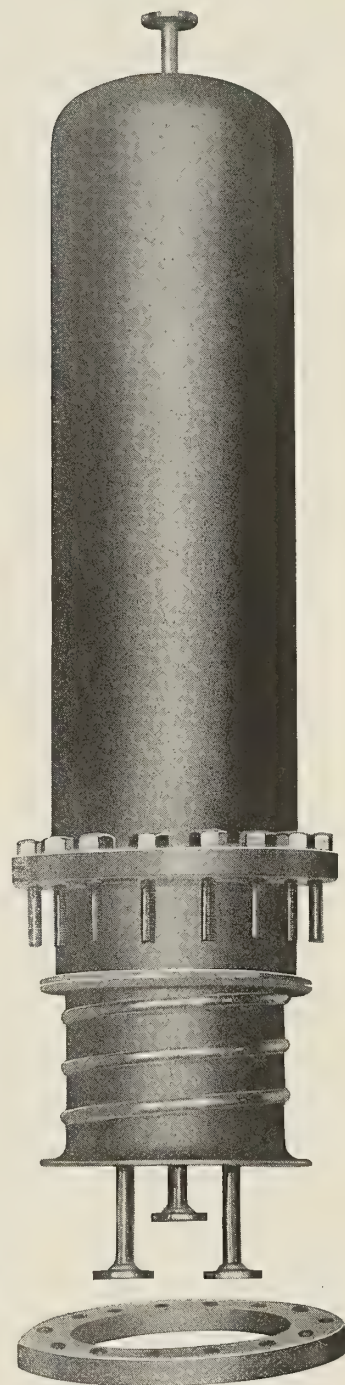
The heating of fuel oil before discharging it through oil burners is a necessary operation, consequently your oil heater is a very important part of your oil burning system. Oil is a poor conductor of heat, and in order to heat it efficiently and quickly it should be caused to flow over the heating surfaces in a film-like condition and at a high velocity in order to obtain maximum heat transfer.

On account of the thick and viscous crude oils and residuum which are employed today for fuel purposes, this maximum heat transfer will not maintain unless the heating surfaces of your heater can be kept clean. Would you have a boiler in your plant whose heating surfaces could not be cleaned?

This latest "COEN" product is the result of years of scientific experimenting and testing, and in offering it to you we offer an oil heater that for Efficiency, Economy, Strength and Durability has no equal.



Pat. Applied for



Heating Surface Exposed

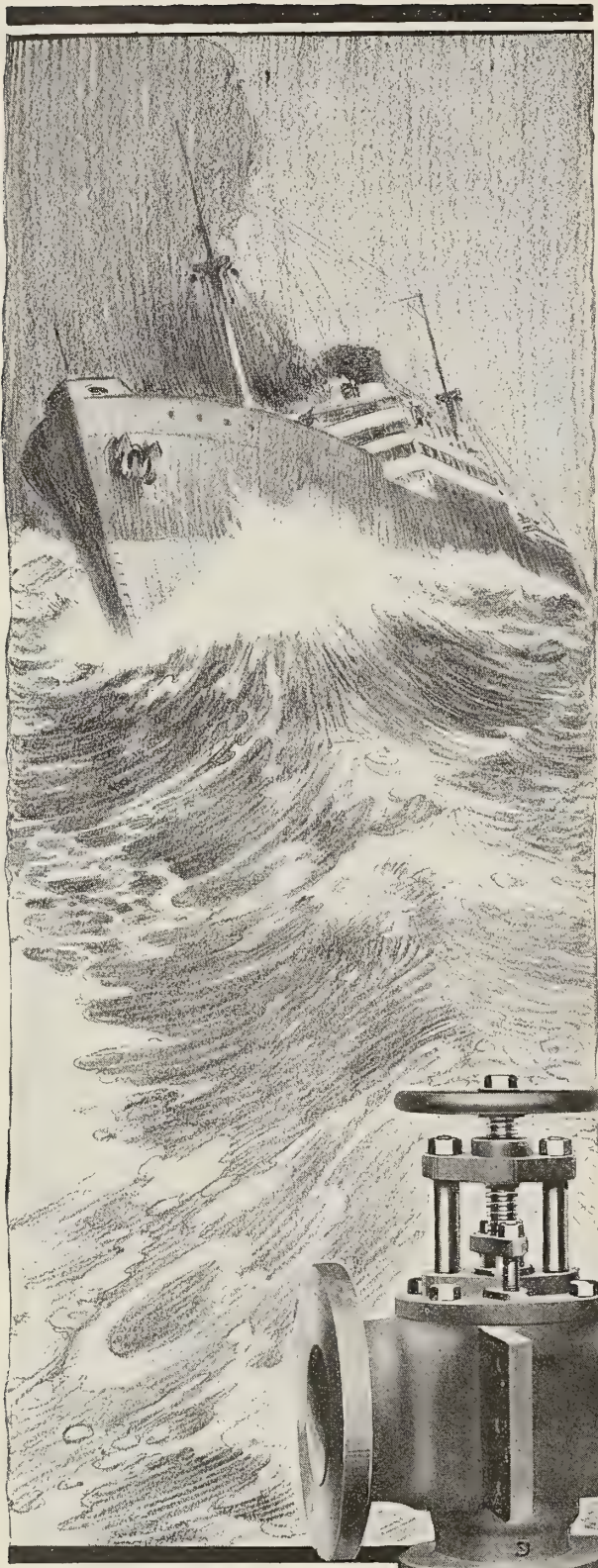
COEN COMPANY, Inc.

Oil Burning Equipment

SAN FRANCISCO

NEW YORK

LOS ANGELES

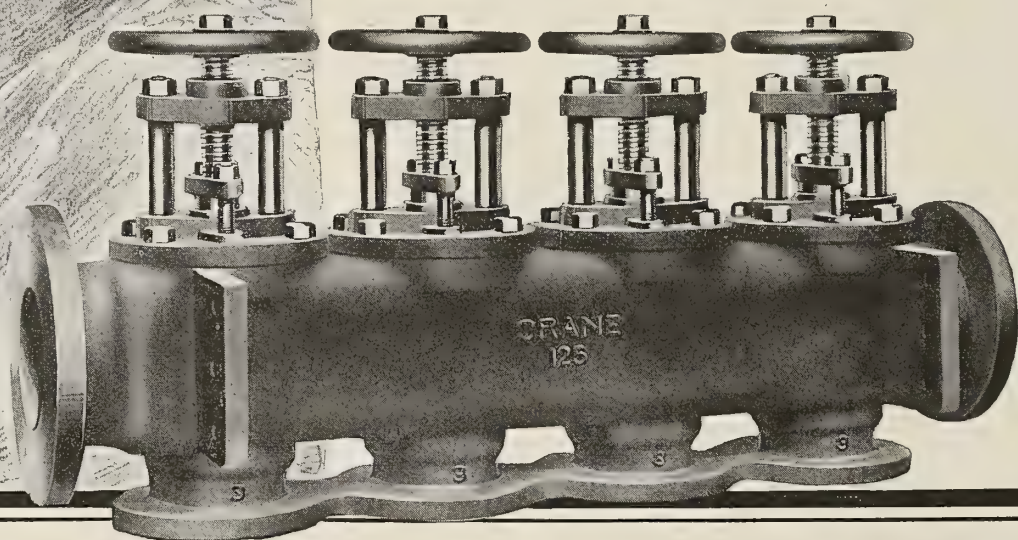


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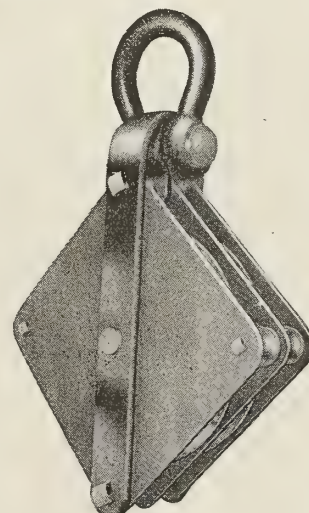
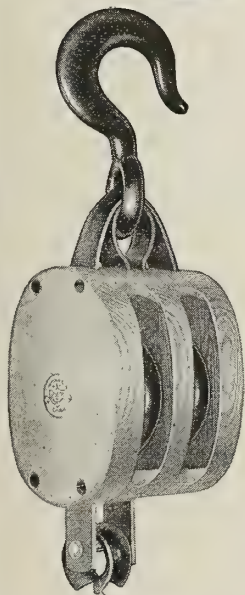
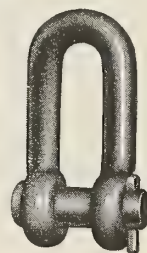
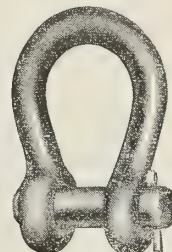
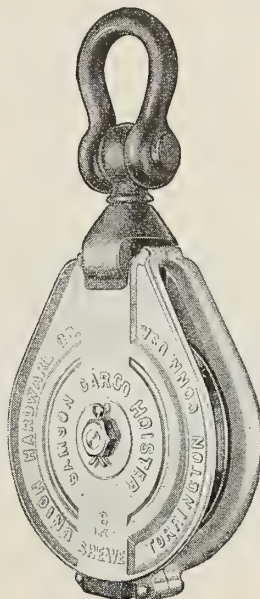
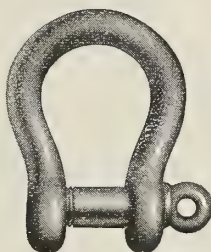
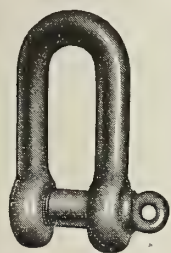
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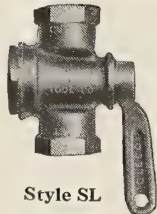
New York Office

99 Chambers Street

Cleco

PRESSURE-SEATED AIR VALVES

THE VALVE THAT NEVER LEAKS



Style SL



Style FW



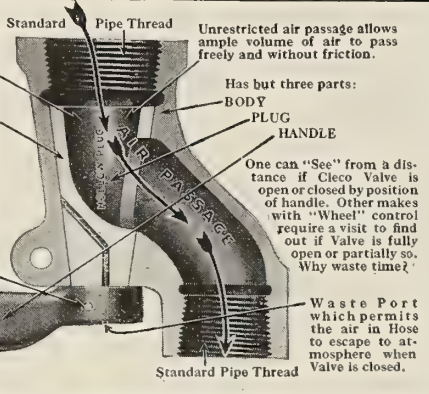
Style A

There is a Cleco Valve made for every need on Air Systems, from Compressor to the Air Tool and for Hose Lines.

No "Packing" required. The Hollow Plug is Pressure-Seated, and by constant use automatically reseats itself.

Body and Plug are ground in position. The "taper" of Plug is carefully figured out in all sizes of Valves to allow easy turning of Handle under all pressures.

Handle is pinned on solid end of Plug. No "nut" as in the ordinary Plug Cock for men to tamper with or to get loose, allowing plug to get off seat and cause leakage.



Write for illustrated Bulletin No. 43



Style PO

Multiple Outlet Valves are made in all sizes for Machines having Double-Acting Pistons and for Foundry Molding Machines.



Style LW



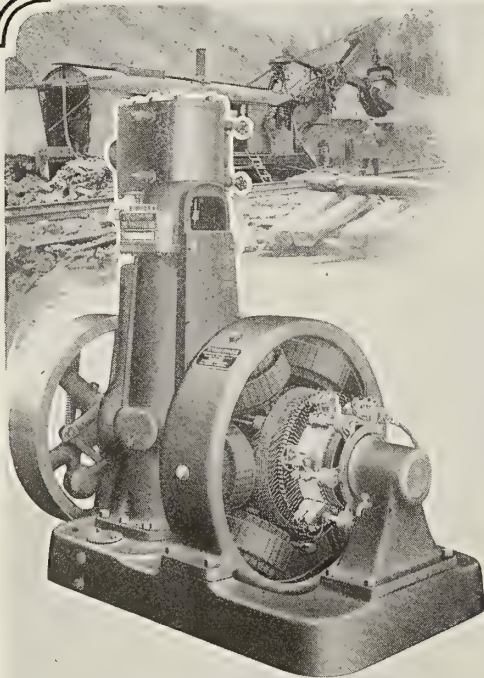
Style FWL



Style RA

THE CLEVELAND PNEUMATIC TOOL COMPANY,

New York Boston St. Louis Chicago Philadelphia Pittsburgh San Francisco Detroit Minneapolis
CLEVELAND PNEUMATIC TOOL CO. of Canada, Limited 84 Chestnut St., Toronto, Ont. 84 Craig St. W., Montreal, Que.



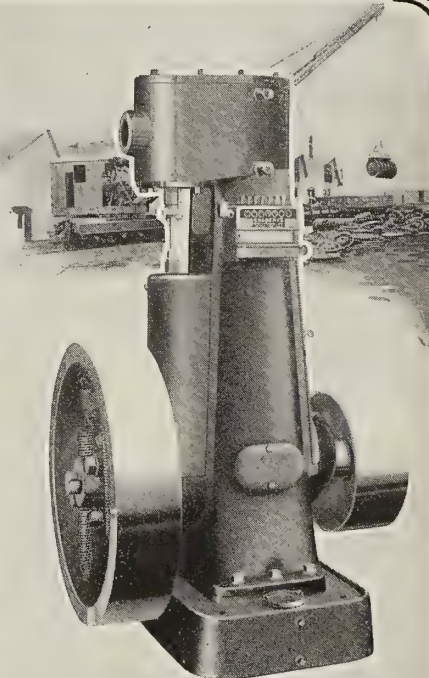
GENERATING SETS
1 TO 50 K. W.

Described in Catalog 103



Engberg Generating Sets are most economical and dependable, making them especially satisfactory for all kinds of service where continuous and satisfactory operation is desired.

Engberg Engines are desirable for all power purposes. They combine every distinctive, discriminating and serviceable feature essential for proper performance.



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ENGBERG'S
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LIDGERWOOD STANDARD WINCHES

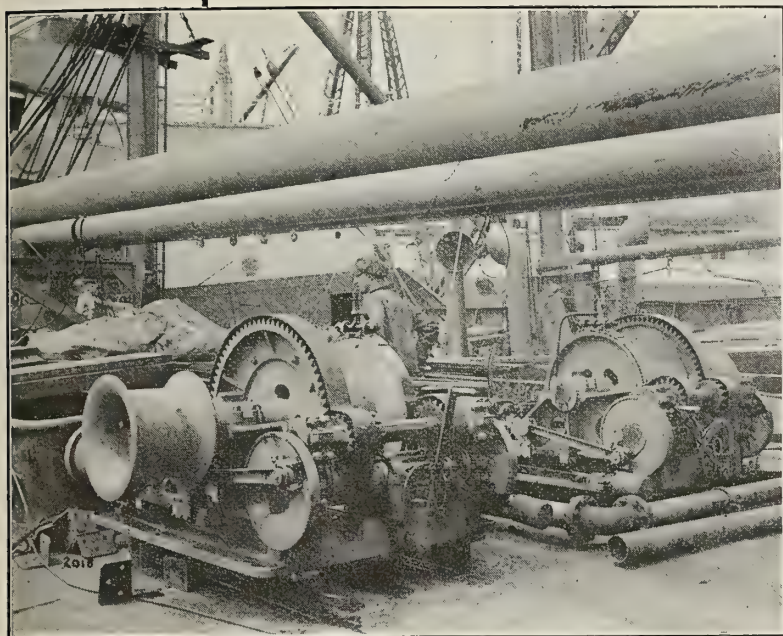


Illustration shows Lidgerwood Cargo Winches installed on

S. S. AMERICAN
S. S. HAWAIIAN
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of the American United Lines.

Lidgerwood standard cargo winches have proven their worth as speedy handlers of cargo that stand up to their work.

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DOCK WINCHES
TOWING ENGINES

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Two-Speed Winches. Catalog No. 1918-C.

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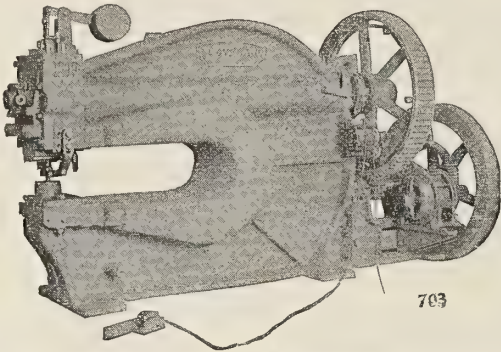
- 150. TONS
- 1250. "
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- 2000. "
- 3500. "
- 4500. "
- 5000. "
- 6000. "
- 8000. "
- 10000. "
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WILLIAM T. DONNELLY,
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703

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ETC.**

Every variation of size, capacity, power application or type; every refinement for quicker and safer operation; every provision for longer life and greater strength. . . .

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PAGE-ARMCO Welding Rods and Electrodes meet all requirements of the American Welding Society Specifications.

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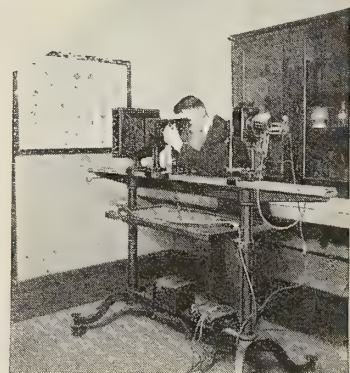
GENERAL SALES OFFICE: Grand Central Terminal, New York City
DISTRICT SALES OFFICES: Chicago, Pittsburgh, San Francisco, Portland, Ore., Adrian, Mich.



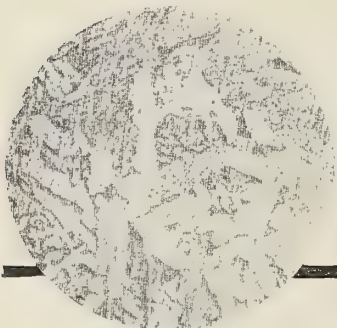
PAGE-ARMCO

WELDING RODS and ELECTRODES

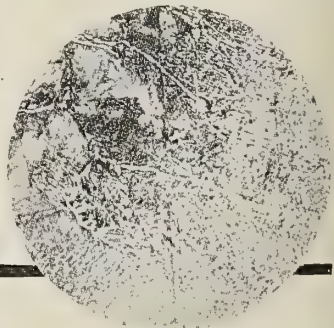
Etching and Polishing equipment for preparing specimens for microscopic examination.



Microscopic examination where specimens are magnified from 100 to 1000 diameters.



Photomicrograph of acetylene weld.



Photomicrograph of electric weld.

WAINWRIGHT OIL COOLERS



Wainwright Oil Cooler for Marine Installations

In turbine installations requiring forced feed lubrication of bearings, better results are obtained at high oil velocities, as it is of advantage to circulate a large quantity of oil through a small range of temperature, thereby keeping the oil moderately near the bearing temperature for the reason that warm oil absorbs heat more readily than cold oil.

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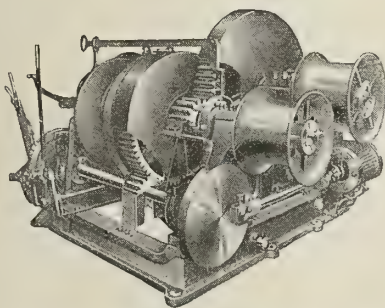
FLORY WINCHES

ANY TYPE

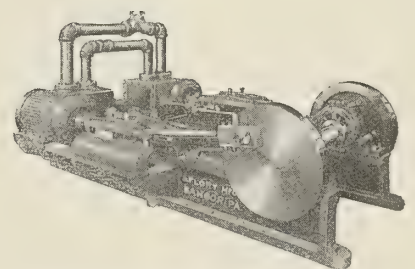
Steam or Electric

ANY SIZE

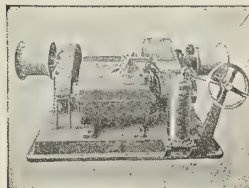
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Combined Friction Drum and Link Motion — Independent Clutch Winches—Cut Steel Gearing, fully enclosed.



Heavy Duty, Double Cylinder Engine With or Without Reverse Gear. For Driving Dredge Machinery.



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S. FLORY MFG. CO.

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Ship Radio Inspection *One Phase of World-Wide Wireless*

The interest of the Radio Corporation of America in its ship-sets does not end with their installation. Inspection Service Stations are located in all important seaports. Through these stations the Radio Corporation of America keeps its ship-sets at the highest point of efficiency.

Ship-sets may be bought or leased from the Radio Corporation of America. But whether bought or leased the ship owner commands the Radio Corporation of America's Inspection and Maintenance Service. Ship owners may

also call upon the Radio Corporation of America for licensed, highly skilled operators.

All this is but part of the World-Wide Wireless service of the Radio Corporation of America at all important seaports of the United States.

The Radio Corporation of America has equipped thousands of ships with wireless apparatus. This apparatus always embodies the highest engineering skill. For behind the Radio Corporation of America stand the splendidly equipped Research Laboratories of the General Electric Company, the American Telephone & Telegraph Company, and the Western Electric Company, where, year in and year out, eminent physicists conduct investigations that result in new radio advances.



It will be a pleasure for our nearest office to furnish information.

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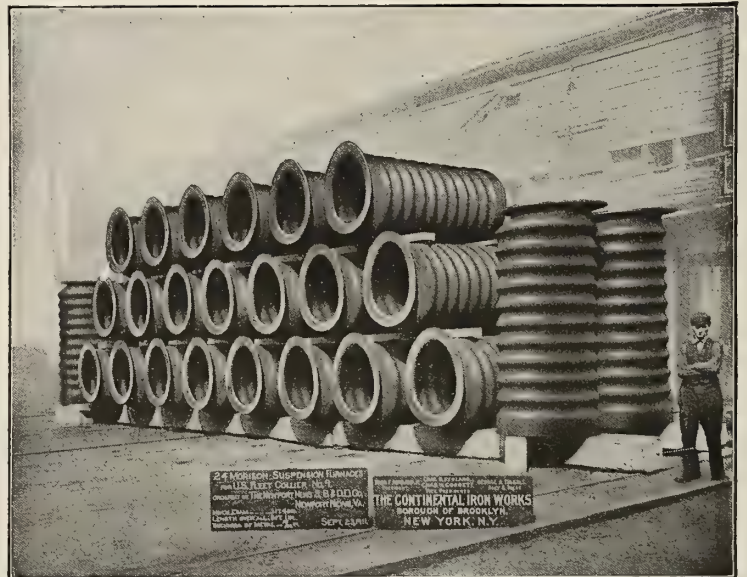
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MORISON SUSPENSION FURNACES *for* LAND and MARINE BOILERS

UNIFORM THICKNESS
EASILY CLEANED
UNEXCELLED STRENGTH



MADE TO UNITED STATES, AMERICAN
BUREAU OF SHIPPING, LLOYDS, BUREAU
VERITAS, OR ANY OTHER REQUIREMENTS

MADE IN THE UNITED STATES BY

THE CONTINENTAL IRON WORKS

West and Calyer Streets,

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Established 1859

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Incorporated 1887

PARKESBURG

Charcoal Iron Boiler Tubes

An Indication of Confidence

As a general thing, ships equipped with charcoal iron boiler tubes carry only a few extra tubes for emergencies, while ships fitted with tubes of other material usually carry a full set of spare tubes.

The confidence thus evidenced in the charcoal iron boiler tube is the natural result of years of dependable tube service. Charcoal iron tubes are practically standard in marine use.

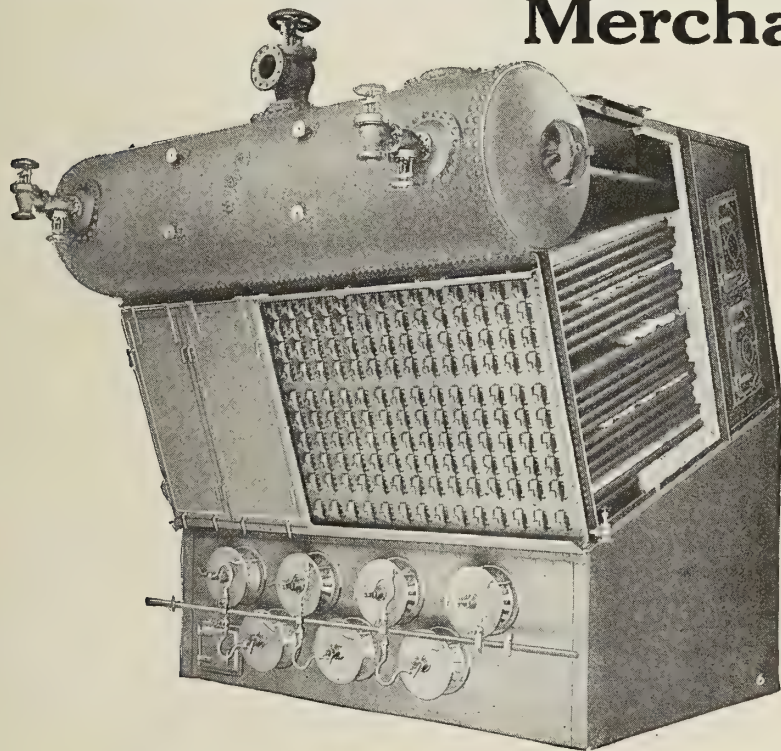
Specify Parkesburg Charcoal Iron Boiler Tubes. They are made of genuine charcoal iron, are easily applied, and give years of service.

PARKESBURG IRON COMPANY

PARKESBURG, PA.

New York Boston Philadelphia Chicago New Orleans
San Francisco Norfolk St. Louis St. Paul

Ward Boilers Are Keeping America's Merchant Marine Fit



in lessening breakdowns, in making better time in voyage, in standing up under forced action—and in keeping ships and freight moving.

Seamless straight drawn tubes expanded in—front and rear header frames carefully machined and fitted—all parts designed with a high factor of safety, are items that go to make the Ward Boiler absolutely reliable.

Made to burn either coal or oil—compact steel construction—strong and light, Ward Watertube Boilers cut down upkeep and operating costs to a minimum.

You will be interested in other Ward features, too—Let us tell you of them.

The Charles Ward Eng. Works

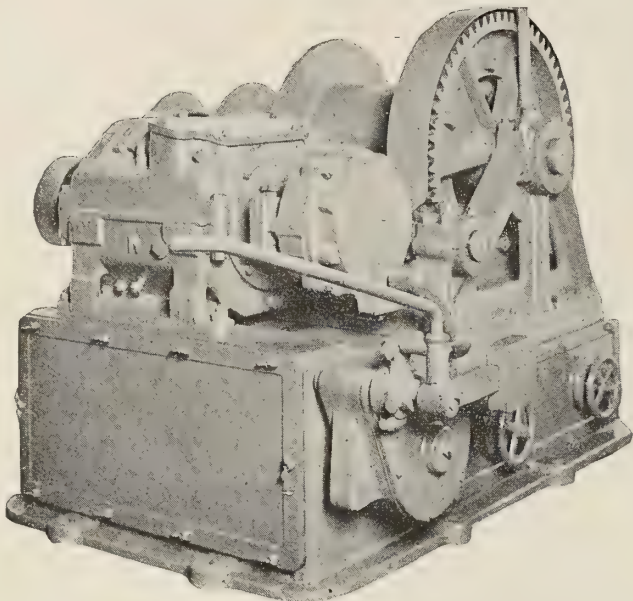
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New York

Ward Boilers evaporate 17 lbs.
of water to one pound of fuel oil

"CUNNINGHAM" QUALITY DECK MACHINERY



ELECTRIC CARGO WINCH

Ruggedly built, Waterproof, Simple, Accessible, and "Fool Proof."

Largest number of Electric Winches installed on American Merchant Ships have been designed and built by **Allan Cunningham Co.** and have been demonstrated superior to all other types in speed and safety in handling cargo, economy in operation and repair costs.

The **Electric Winches** are designed and built with the same care and thoroughness as the well known **Cunningham** steam machinery and equipment.

They are not experimental but have been demonstrated as satisfactory in five years' service.

CUNNINGHAM STEAM MACHINERY AND EQUIPMENT

Have earned reputation for unequalled satisfaction in service. Early deliveries can be made of either Steam or Electric Equipment.

ALLAN CUNNINGHAM COMPANY, Inc.

Builders of Steam and Electric Winches, Windlasses, Capstans, Steering Gears and Telemotors.

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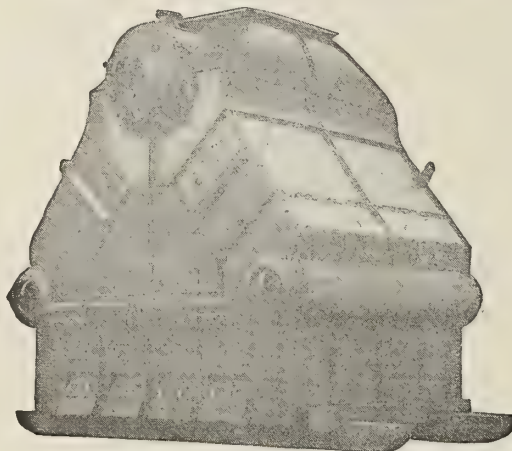
LUDLUM WATER TUBE MARINE BOILER

The New Marine Standard

A Self Contained Unit

Shipped Completely
Erected

Unequalled
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On Skids, Ready for Shipment as a Unit

All Wrought Steel

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Quick deliveries assured from ample stock of material on hand.

Write for the Catalogue.

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2 Rector Street, New York

Works—Yonkers, N. Y.

MARINE DEPARTMENT *of*

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FRICK BUILDING

PITTSBURGH, PENNA.

BUILDERS OF
STEEL BARGES
for RIVERS and HARBORS

CAR-FLOATS



Photograph by U. S. Army Air Service

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

Shipbuilders and Ship Repairers

Three Large Graving Dry Docks. Steel, Brass and Iron Foundries, Heavy and Light Forgings.
Complete facilities at one plant for doing any ship repair job quickly.

Plant located at Newport News, Va., on Hampton Roads
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THE CRANDALL ENGINEERING CO.

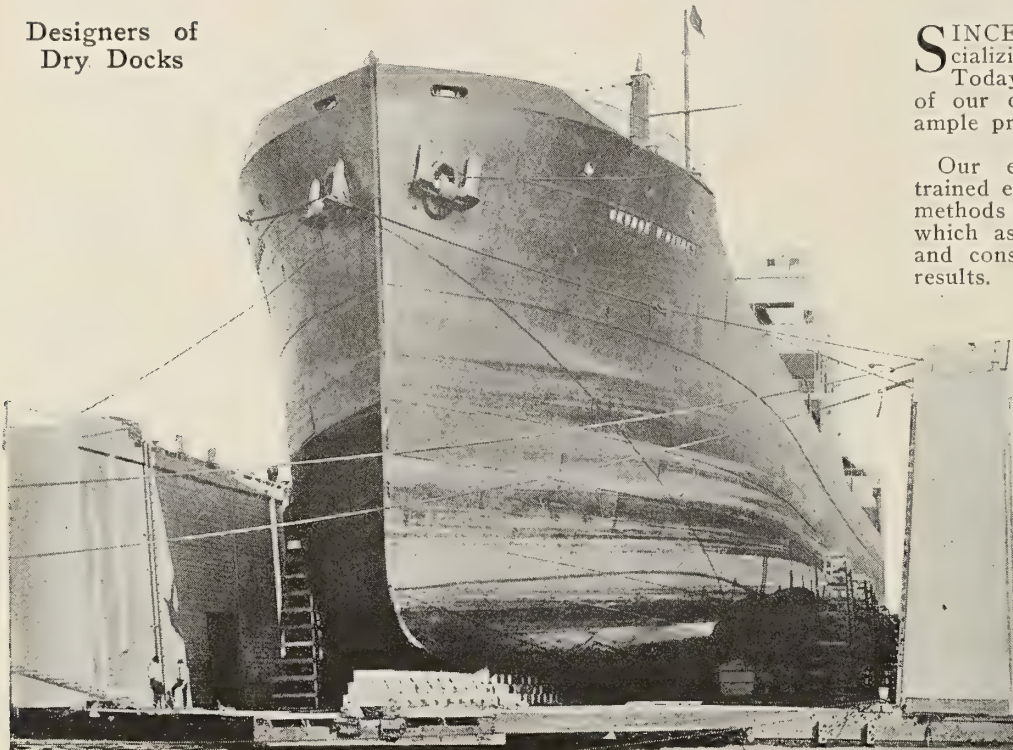
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Designers of
Dry Docks

SINCE 1854 we have been specializing in designing dry docks. Today more than 140 dry docks of our design are in operation—ample proof of our experience.

Our experience, our specially trained engineers, our construction methods comprise a unique service which assures economy in design and construction and certainty in results.



8000 Ton Floating
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Go To Tiebout First

*"We've looked all over for these things—
and here you have them right in stock."*

Many new customers are astonished at the complete range of our stock.

It is an old story with our clientele of years' standing.

Simply the result of years spent in studying the needs of the trade.

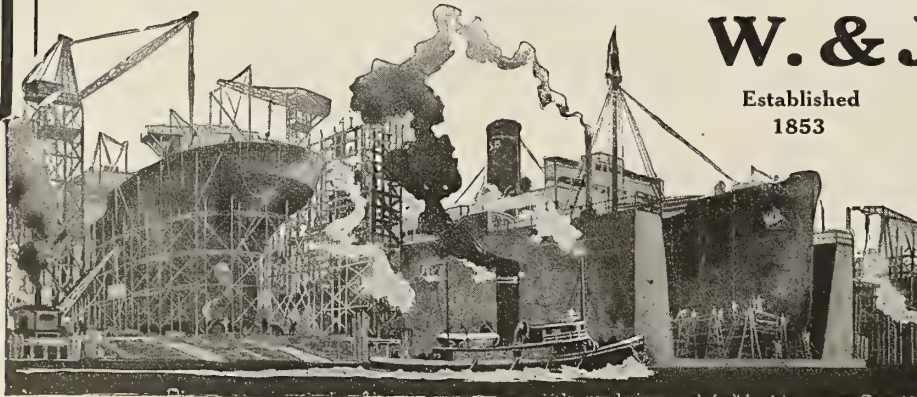
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Cabinet and Refrigerator Hardware

W. & J. TIEBOUT

Established
1853

Incorporated
1892



118 Chambers Street
New York City

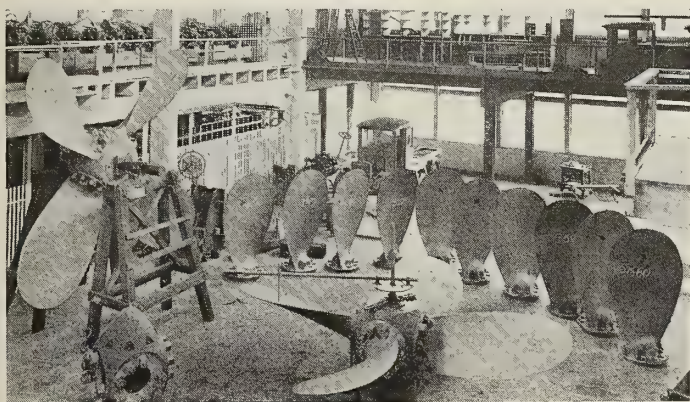
MANGANESE BRONZE PROPELLERS

SOLID AND BUILT UP WHEELS ALL SIZES

Earliest delivery, lowest quotations, accurate pitch, perfect balance. Guarantee tests. 65,000 lb. tensile strength, 30 per cent elongation.

More than one hundred large steamship propellers delivered in year ending July, 1921, for vessels of leading steamship companies and U. S. Shipping Board.

BRONZE CASTINGS ALL SIZES UP TO 40,000 LBS.



Foundries } SEATTLE, WASH.
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DORAN BRASS FOUNDRY CO.

Represented by

MARITIME ENGINEERING & SALES CORP.

2 Rector St., New York

TELEPHONE RECTOR 2318

Shove a thin rule up through a joint of your pipe covering

If your test shows that the distance from the pipe to the outside of the covering is the thickness of the covering, then there is no loss through sagging.

But often such a test shows that, though the covering looks snug from the outside, it has charred and sagged perhaps a quarter of an inch and air currents are moving along under the pipes and escaping at the joints. Such a pipe covering is robbing you daily.

Some pipe coverings contain from 20 to 22 per cent. of inflammable material that chars under high temperature and gradually develops a sag.

85% Magnesia, on the other hand, is not affected adversely by very high temperatures. Tests at temperatures continued at from 700 to 900

degrees show an actual gain of about three per cent. in efficiency. No other material has the heat-saving efficiency of 85% Magnesia. It is light and yet strong enough. Neither water nor heat impairs it.

Ask for a copy of our revised book, "Defend Your Steam," giving much valuable information about heat insulation, tables, interesting applications, etc.

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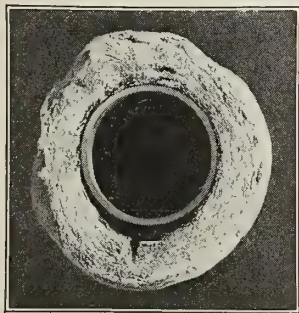
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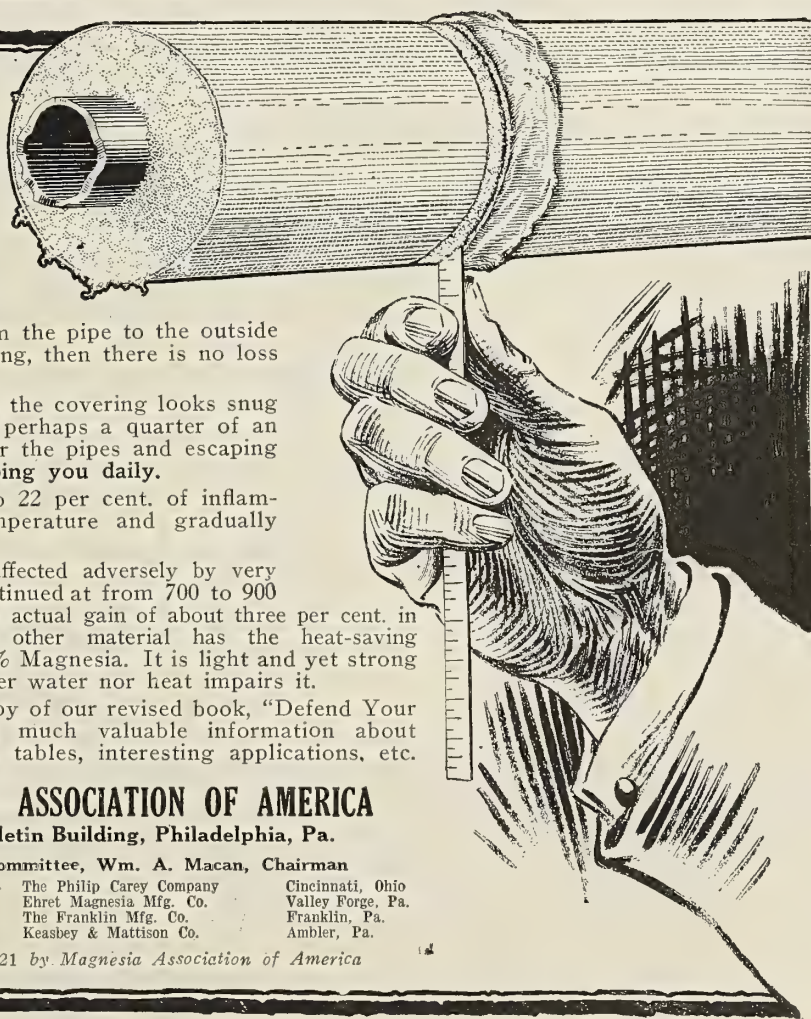
Franklin, Pa.

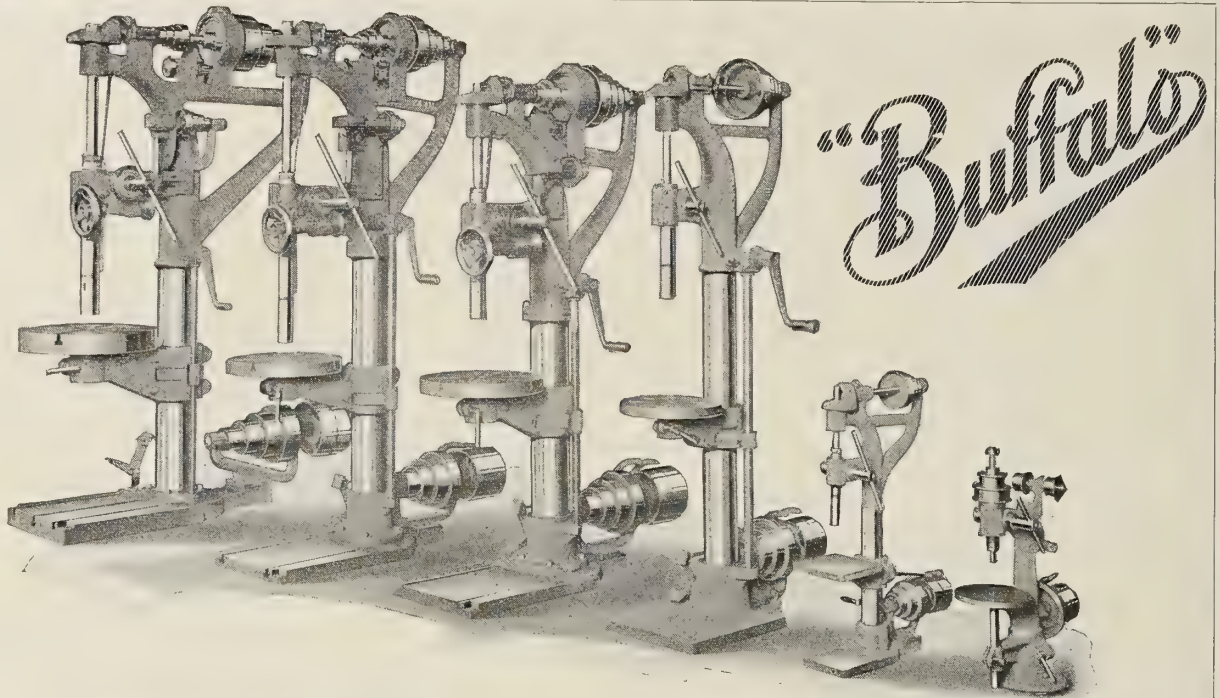
Ambler, Pa.

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Cross-section of pipe covering that has sagged because of charring of the inner layers of the material.





The complete Buffalo drill line includes 25" 24" 20" 15" 10" 10" Jr.
Each drill is a worthy addition to the Buffalo line of machine tools. Dept. 63
will send you catalogue giving complete information.

BUFFALO FORGE COMPANY
BUFFALO NEW YORK

A Message to Ship Builders, Owners and Operators:

Just consider for one moment, the great advantages afforded by

LIT-O-SIL-O

"The Modern Decking"

It is fire-proof and vermin-proof, it is water-tight, it is a "one piece" decking. - It can be worked with wood-workers' tools, it can be laid four times as quickly as wood decking, it weighs less than 8 lbs. per square foot, for a thickness of 1½", it has a tensile strength of 600 lbs. per sq. in., it will not warp or buckle, it is almost noiseless to the tread,

"IT IS IN USE ON OVER 350 VESSELS"

Isn't this proof of its superiority?

MADESCO



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World-Wide Freight Service



Our reputation for dependability in freight carrying, as well as in passenger service, has been won by regularity and frequency of sailings. The American Line, for instance, first to re-establish direct service to Germany after the war, has not missed a scheduled sailing since December, 1919.

Some steamer of the International Mercantile Marine Company sails nearly every day, and you can route your freight by one of our Lines with assurance of prompt loading and delivery on scheduled time.

WHITE STAR DOMINION LINE AMERICAN LINE
ATLANTIC TRANSPORT LINE LEYLAND LINE
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REGULAR SAILINGS

FROM

New York	Portland, Me.	Norfolk
Boston	Montreal	Mobile
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TO

London	Antwerp	Genoa
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Glasgow	Gibraltar	New Zealand
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INTERNATIONAL MERCANTILE MARINE COMPANY

A. C. Fetterolf, Freight Traffic Manager

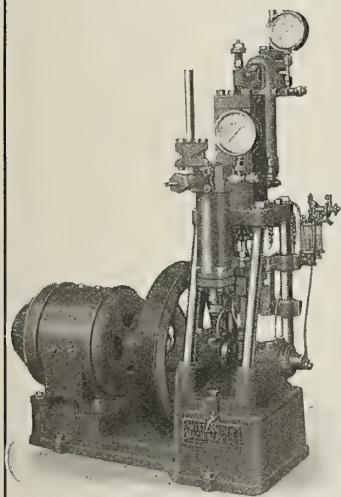
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VERTICAL MARINE TYPE CO₂ Compressor



This compressor is a great favorite among Marine Engineers. Open type—all parts easily accessible—occupies a minimum of space.

MARINE REFRIGERATION

The CO₂ system of refrigeration is used very extensively on Ocean and Lake Steamers and especially on Battleships and other Navy vessels where safety in operation is most necessary.

CO₂ is safe and non-explosive.

Ammonia or Sulphur Dioxide Machines are prohibited in the United States Navy Battleships—because they are *dangerous*. A mistake on part of the operator or a break caused by defective material often results in loss of life and damaged property.

Keep on the safe, efficient and economical side, by installing a Wittenmeier CO₂ System of Refrigeration.

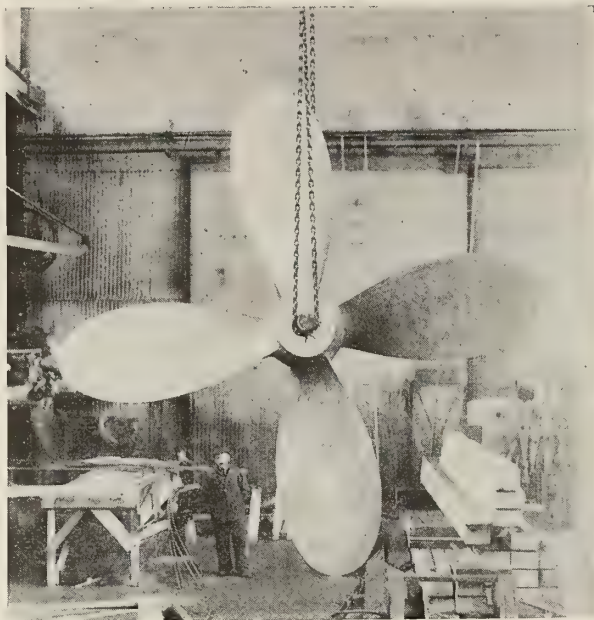
Let the action of the United States Navy guide you in your buying. May we send full details?

WITTENMEIER MACHINERY CO.
Chicago, U. S. A.

Steamer Joseph Block of the
Inland Steamship Company
CO₂ equipped.



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MANGANESE
BRONZE

STANDARD FOR TWENTY YEARS FOR PROPELLERS

SOLID BRONZE PROPELLERS FROM 8 INCHES TO 20 FEET IN DIAMETER
BRONZE BLADES AND HUBS OF ANY SIZE

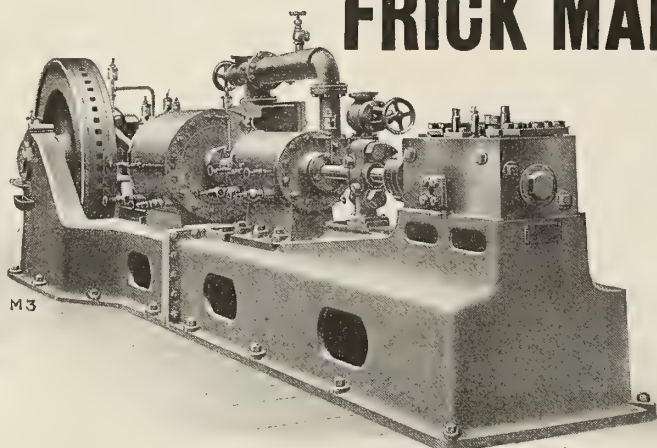
HYDE WINDLASS COMPANY, BATH, ME.

New York Office, 25 West 43d Street

3



FRICK MARINE REFRIGERATION

CO₂ Compression Machine

stands for better sanitary conditions, even temperatures, improvement in the quality of the goods stored and a reduction in the amount of goods lost.

Heavily built and reliable machinery is essential in the successful operation of the modern refrigerating plant. The QUALITY, EFFICIENCY and DURABILITY of FRICK Refrigerating Machinery are never questioned.

CO₂ COMPRESSION and AMMONIA COMPRESSION Refrigerating Units in any size to meet requirements.

BRANCHES:

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Frick Company
WAYNESBORO, PA., U.S.A.
ICE MACHINERY SUPERIOR SINCE 1882

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YORK MECHANICAL REFRIGERATION

The RELIABLE REFRIGERATION for every Practical Purpose on Board Ship

The governing factor in the selection of Marine Refrigerating Equipment, in most cases, is the reliability of the machine. Can it be absolutely depended upon to perform the work? An enforced shut-down of the refrigerating machine while on a voyage may mean the loss of a large portion of the ship stores, or perhaps of the cargo.

York Refrigerating Machines have demonstrated their absolute reliability by more than thirty-five years of satisfactory service, which has given them a high reputation throughout the refrigerating field.

Hundreds of vessels now plying the seven seas employ York Mechanical Refrigeration, to the satisfaction of their crews and profit of the owners. We invite all shipping interests to investigate the York Systems of Marine Refrigeration, and believe it will prove profitable to them.

YORK MANUFACTURING COMPANY

(Ice Making and Refrigerating Machinery exclusively)

YORK, PA.



Federal Marine Paints

SUN, wind, salt spray and wave action in hot or cold climates have little effect on Federal Paints. They are thoroughly waterproof, resist abrasion, do not chip off or crack, and will give much longer service than ordinary paint. Federal Bottom Paints are rust-resistant and powerfully germicidal.

Other paints may be cheaper in initial cost, but it's far cheaper to paint once with good paint than to paint several times with poor paint.

When painting specify Federal—or let us do your cleaning and painting—Descriptive folder and color card on request.

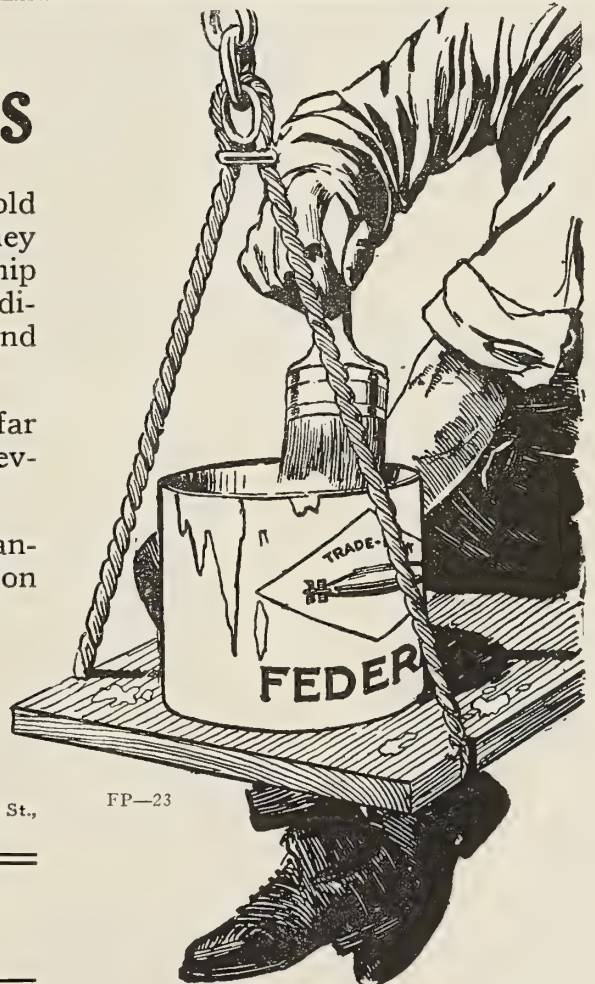
The Federal Composition and Paint Co., Inc.

17 Battery Place

New York, N. Y.

Boston	Newport News	Jacksonville	Mobile	Los Angeles
Philadelphia	Savannah	Tampa	Seattle	San Francisco
Baltimore	Pensacola	New Orleans		

Great Britain: The British Anti-Fouling Composition & Paint Co., Ltd., 130 Fenchurch St., London, E. C. 3, England



FP-23



FEDERAL MARINE PAINTS

"Weather-best"

Fairbanks-Morse

"C-O" Marine Oil Engines



16,000 Miles Through Arctic Seas Without a Hitch

From Seattle to Nome, Alaska, and thence to the Siberian Coast—16,000 miles in all—is the record made by the "Bender Brothers" on her first trip with her new 100 H.P. "C-O" engine.

Her skipper says that even in the heaviest weather in the ice bound Arctic, her engine performed steadily and drove the schooner at an average speed of seven and one-half knots.

"C-O" oil engines, 30 H.P. to 300 H.P., using low priced fuel oils, have established records for unusual fuel and operating economy on all classes of work craft in all waters.

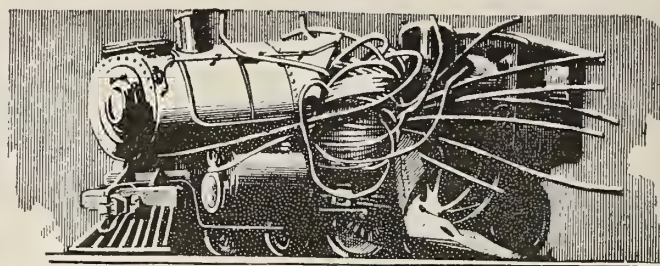
They are simple and sturdy in construction, without carburetors, igniters, timers, switches, or magnetos. Easy to start and operate—inexpensive to maintain.



Fairbanks, Morse & Co.

MANUFACTURERS CHICAGO

Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

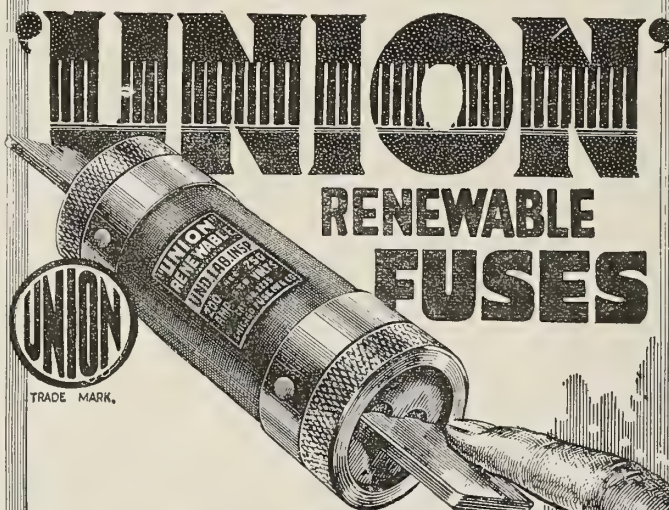


Safety Valves will save Thousands of Fuses

What would happen if the boiler of a railway locomotive were made of fibre the thickness of that used in fuse casings?

That is just what happens to fuses that are not constructed to let the pressure of gases escape quickly when there is a blowout. For blowouts, especially if caused by short circuits, frequently create a pressure higher than that carried by locomotives.

We have at last discovered a way to let the pressure blowout escape before it has time to do any damage to



"Union" Renewable Fuses are now built with four safety valves on each end.

These safety valves consist of small vents or holes in the metal washers, but without a hole in the leather washers. So you see, when a link blows, the pressure lifts the leather washers enough for gases to escape, yet not sufficient to permit any flame to pass.

Simple, isn't it? So simple it's a wonder no one ever thought of it before. Yet, it will save thousands of fuses from being blown to atoms.

"Union" Fuses have many other valuable features found in no others—features that make them the cheapest fuse on the market to use.

The "Union" saves more than ANY other renewable fuse.

"Union" Fuses, both Renewable and Non-Renewable, are for sale by all leading jobbers and dealers.

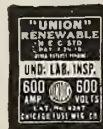
Free descriptive booklet on request

Chicago Fuse Mfg. Co.

Manufacturers of Switch and Outlet Boxes, Cut-Outs, Fuse Plugs, Automobile Fuses, Renewable and Non-Renewable Enclosed Fuses

CHICAGO

NEW YORK



ON THE ADMIRALTY LIST.

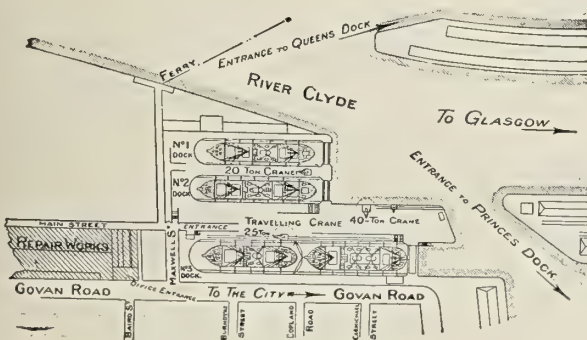
Alexander Stephen & Sons, Ltd.

Shipbuilders, Engineers Boilermakers,

GOVAN GRAVING DOCK REPAIR WORKS

604 GOVAN ROAD
GLASGOW

VESSELS DOCKED AND PAINTED
AND REPAIRS OF ALL KINDS EXECUTED TO HULLS, MACHINERY
AND BOILERS WITH UP-TO-DATE
APPLIANCES, INCLUDING OXY-
ACETYLENE CUTTING AND ELECTRIC
WELDING PLANTS.



Office and Repair Works adjoin the
Largest Graving Docks on Clyde and are
conveniently situated to the Principal
Discharging, Loading and Coaling Berths,
thus ensuring Close Supervision and
Economy of Time.

Telegrams - "MIDYARD, GLASGOW."

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NORWALK

AIR & GAS
COMPRESSORS

No two compression requirements are precisely alike. Hence the wisdom in profiting by the practical experience of the Norwalk specialists who have successfully met all kinds of compressor problems for nearly half a century.

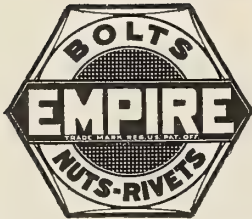
Illustrated Bulletins on Request

The Norwalk Iron Works Co.

Pioneer Builders of Compressors

South Norwalk, Conn.





YOU may have perfect assurance of quality in the separate parts of a ship you are building, but if you lack equal assurance in the matter of the bolts and nuts that hold the assembled units together, you cut heavily into your margin of safety.

Every Empire Bolt and Nut is guaranteed. Strength and close gauging of threads, accurately ground surfaces to insure flush fitting, the choicest soft open hearth steel, inspection that checks and counterchecks—these are the factors that give security.

And then, back of it all, are 75 years of fruitful experience in serving the great industries of the world.

It is SAFER to deal with such a house.



RUSSELL, BURDSALL & WARD
BOLT & NUT COMPANY

PORT CHESTER, N.Y.
CHICAGO • SAN FRANCISCO

ROCK FALLS, ILL.

Makers of Bolts, Nuts and Rivets Since 1845



“AMERICAN” BRAND MANILA ROPE

“THE RELIABLE ROPE”

is preferred by marine men,
because it is consistently good.

It gives—

“MORE VALUE IN EVERY WAY”

We also make—

“American” No. 1 Best Marine Oakum
“That Caulking good Oakum.”

AMERICAN MANUFACTURING CO.
Noble and West Streets, Brooklyn, N. Y.

Western Branch:
St. Louis Cordage Mills, St. Louis, Mo.

***Their teeth are stronger
at the base if they're***

**MAAG
GEARS**

COMPARE these tooth diagrams of a Maag Gear and an ordinary gear. At the base of the tooth, where other gears most often fail, Maag Gears are widest. This "strongest-at-the-base" tooth is typical of all Maag Gears—large or small—and is the fundamental reason for Maag tooth strength and Maag Gear endurance. It means the ability to carry greater loads than ordinary gears will take.

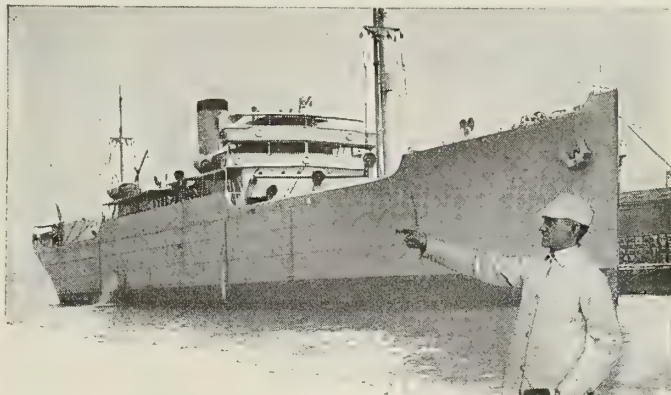
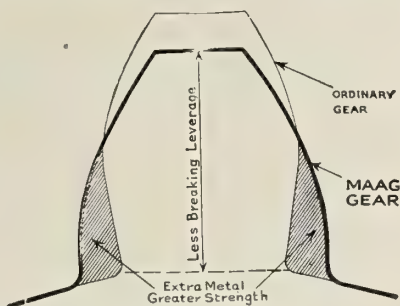
We use Maag Gears on the heaviest machine tools we build. We know they are stronger and longer wearing than any other gears we've ever tried.

You need such gears on your mine equipment. If the machinery you buy now isn't equipped with Maag Gears, replace the first gears worn out with a Maag set and notice the better service and longer life they will give you.

The whole story of the remarkable new gears is told in Catalog No. 265. It is worth a careful reading.

NILES-BEMENT-POND CO.

111 Broadway, New York



"Last time I went over her double bottom with Briggs was just before the war—and that's nearly eight years ago. Since then she's been looking into every port in the Far East—and her Cap'n says her lower insides are still fit as a fiddle."

—**"Bituminous Bill"**

Briggs Bituminous Composition

will do the same for any ship. For protecting inner bottoms, peaks, tanks, bulkhead or compartment doors and walls, chain lockers, etc., it is in a class by itself.

The first cost is a little greater than paint but a single application should last a life time. It forms a tough, firm, elastic coating that does not crack, flake or chip.

Send for our new booklet "The Solution of the Corrosion Problem."

Briggs Bituminous Composition Co., Inc.

17 Battery Place

New York

GREAT BRITAIN:

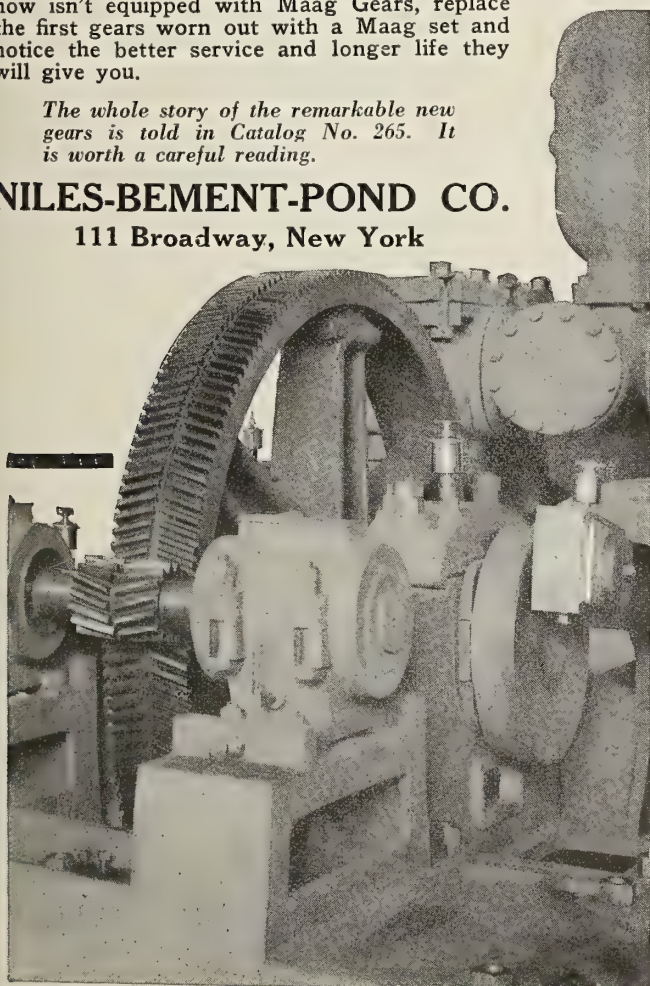
WM. BRIGGS & SON, LTD., DUNDEE, SCOTLAND

BBC-33



BITUMINOUS COATINGS

The Solution of the Corrosion Problem





Four Generations of Skippers Have Used Them

For over four generations, Bay State Marine Paints have sailed the waters of the world. They are the products of over seventy years of experience.

There are Bay State Marine Paints to meet every conceivable ship's need. Among them are stack paint, Columbia Floor and Deck Paint, and Bay State Anti-fouling and Anti-corrosive Paints.

BAY STATE

Marine Paints

are proof against wind and weather, brine and boiling sun. They have been tested in every climate on the globe, and proved superior.

You can get immediate deliveries of Bay State Marine Paints at all New England ports, and the port of New York. Wadsworth, Howland & Company are the largest manufacturers of marine paints in New England.



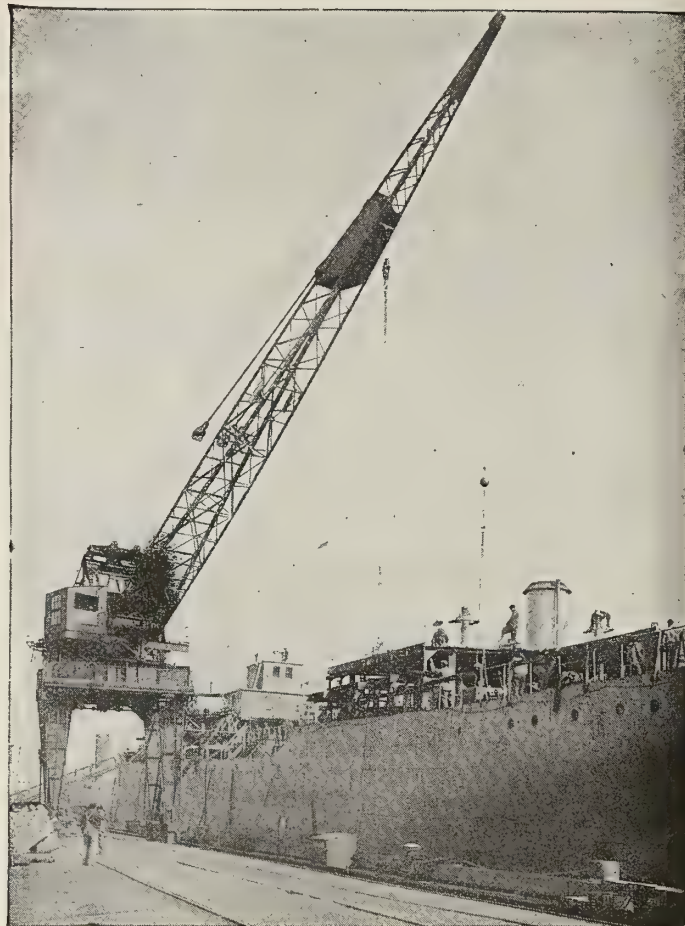
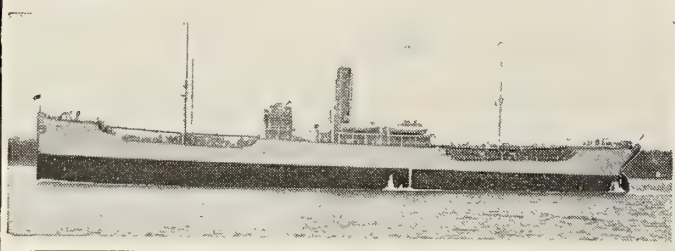
WADSWORTH, HOWLAND & CO., Inc.

*Largest Paint and Varnish Manufacturers
in New England*

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Makes Freight Handling Easy

This big Brownhoist Portal Pier type Locomotive Crane will toy with most bulk and package cargoes which sometimes cause so much trouble in unloading. With its long, high boom it will reach any point on the ship, doing its work rapidly and with no confusion. Or with the auxiliary hoist, it has the titanic strength to lift packages weighing tons and to place them wherever you may choose.

The portal pier is made to span one or more railroad tracks and the cargo may be loaded into the waiting cars or placed in the near-by warehouses. It is a very useful machine about which you should know more. Write for catalog K.

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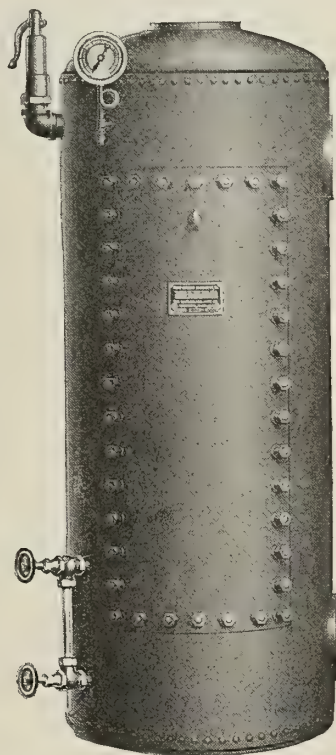
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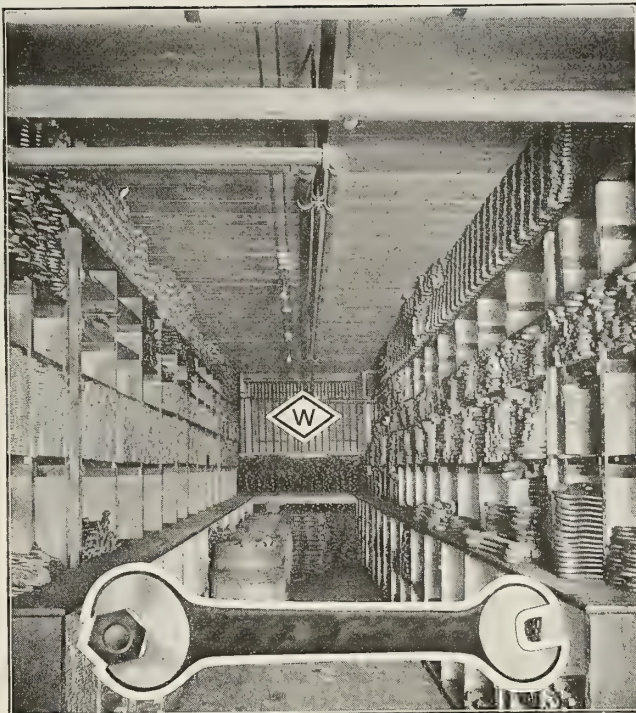
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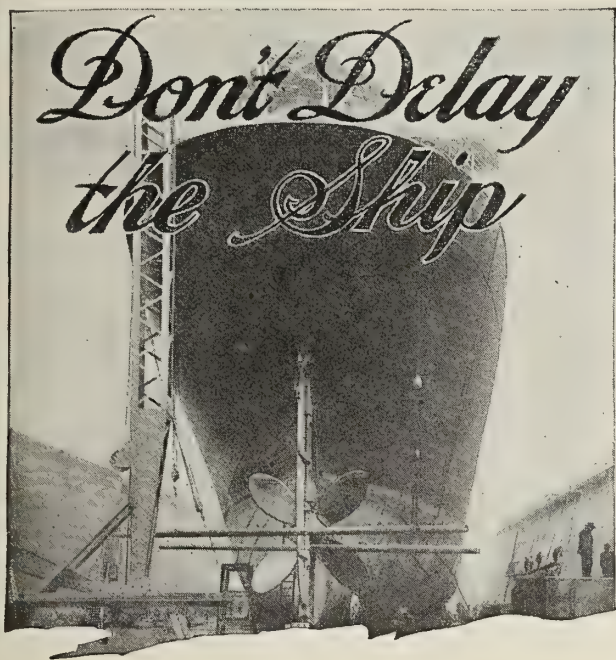
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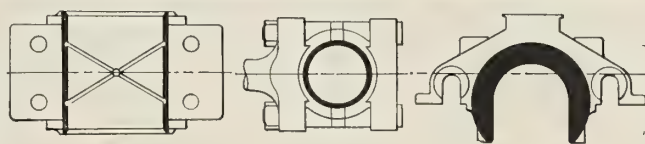
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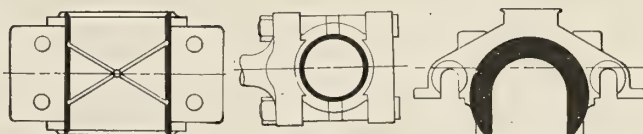
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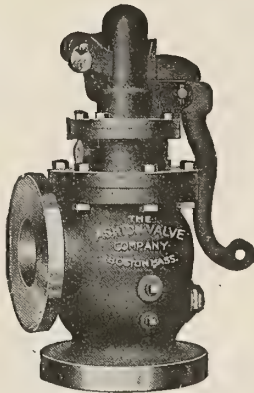
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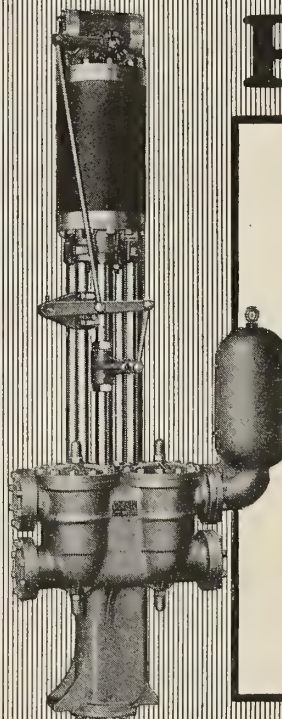
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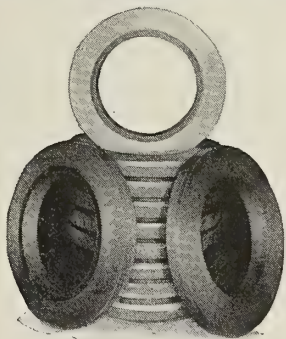
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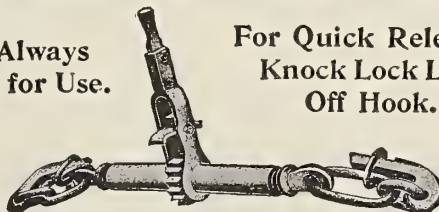
When the turnbuckle must be loosened the same procedure must be used. More time lost.

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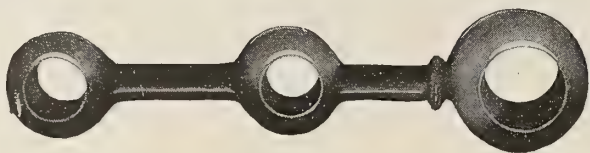


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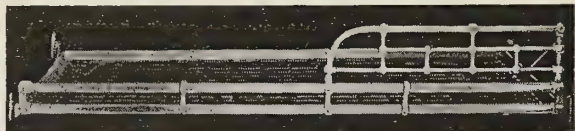
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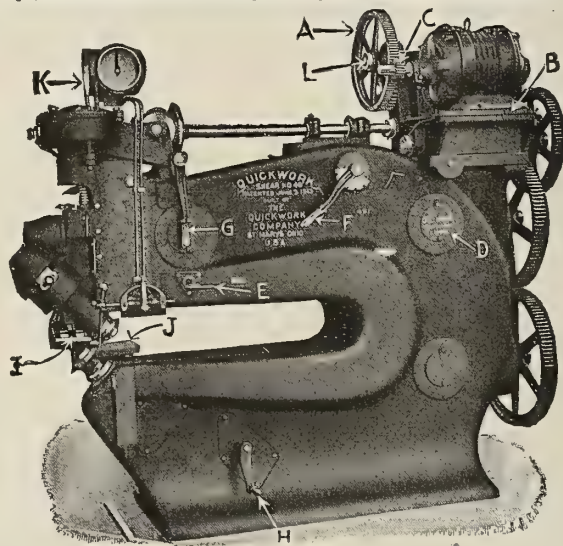
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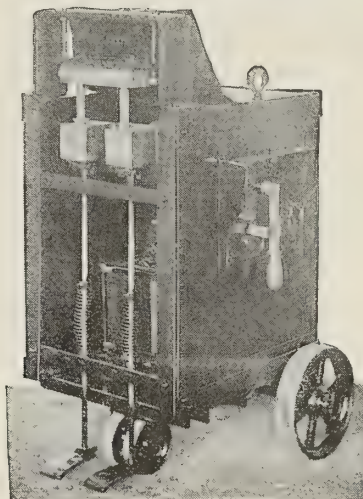
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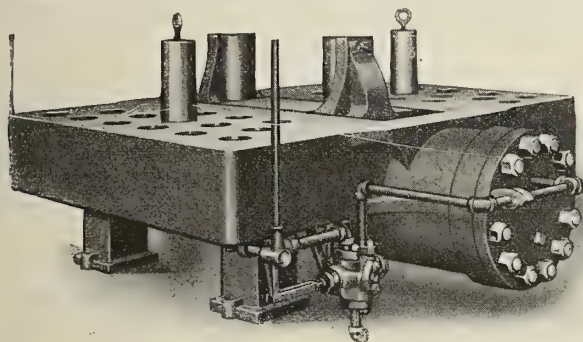
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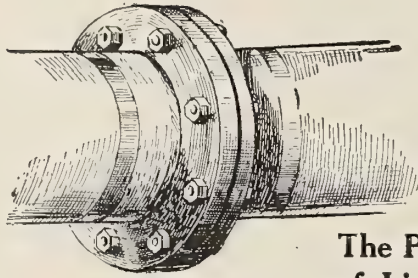
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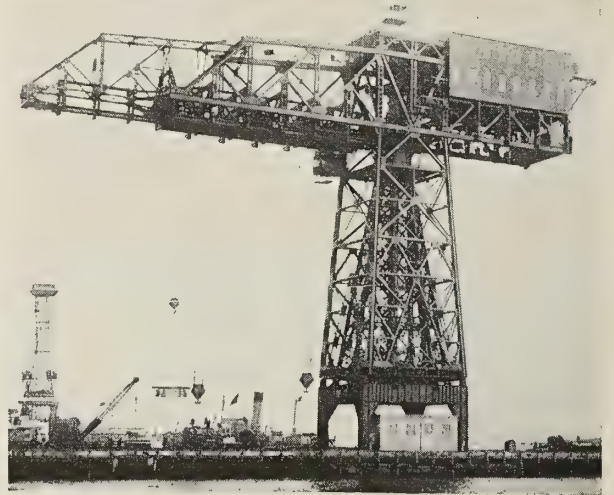
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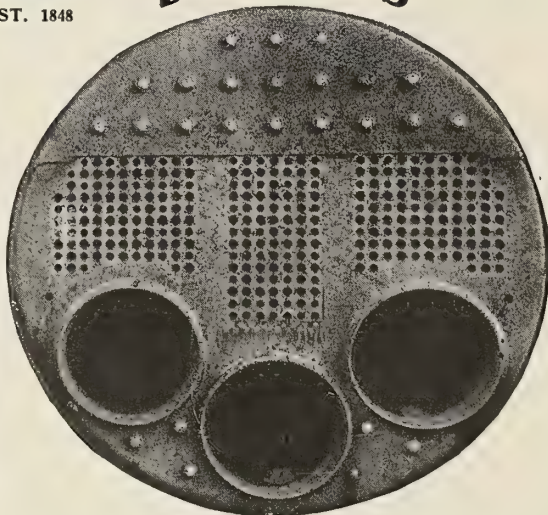


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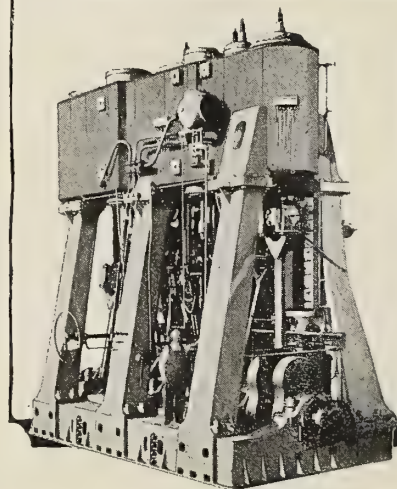


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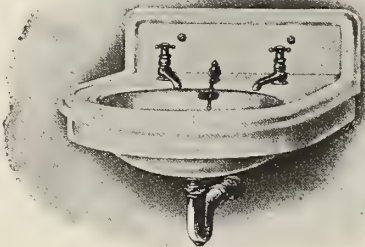


Plate S-208

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WEEK OF NOVEMBER 14, 1921

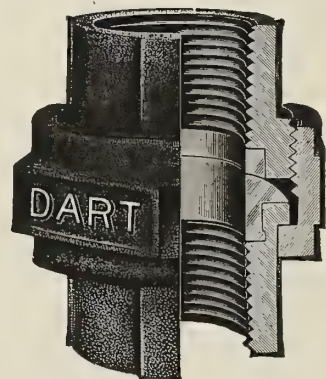
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NEW YORK BOSTON PHILADELPHIA ROCHESTER
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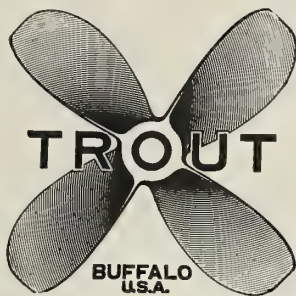
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Solid and Sectional, Bronze and
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The Wager Furnace Bridge Wall has proved its value in actual use under all conditions. It has been giving economical service for years without repairs in the fleets of many of the steamship and railroad companies, as well as scores of ships for the United States Government. Equally serviceable for marine or stationary boilers using either hard or soft coal.

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Used on all types of boilers by all the Principal Navies of the World
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ADVANTAGES:

Quick and reliable observation of the water level. Safe, sure and durable at high pressures. Not affected by cold air drafts. Most effective protection against injuries to boilers and workmen. Easily applied to all types of gauge glass fittings.

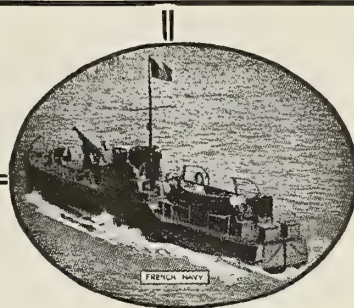
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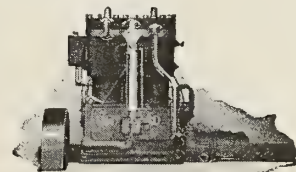


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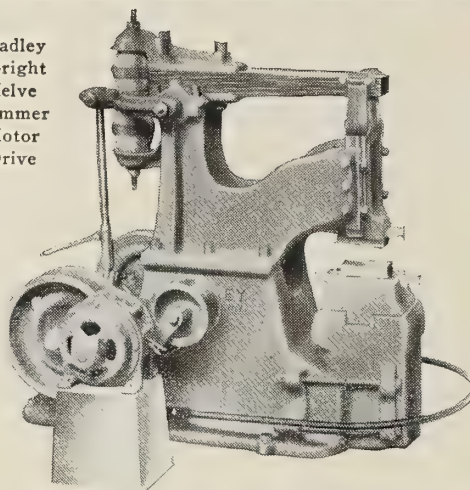
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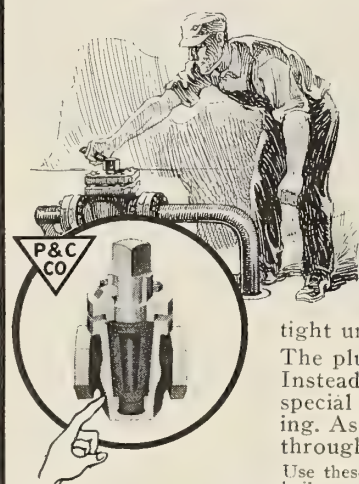
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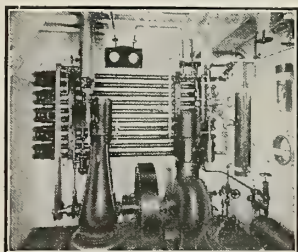
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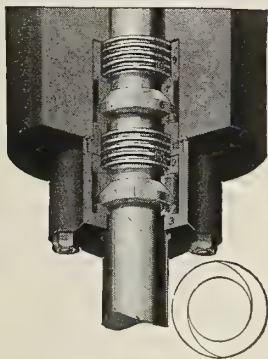
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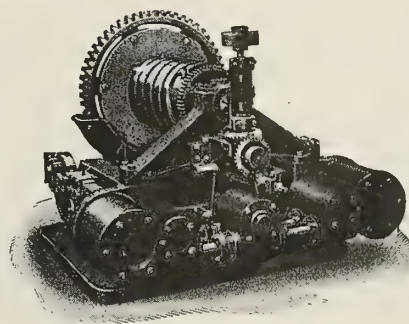


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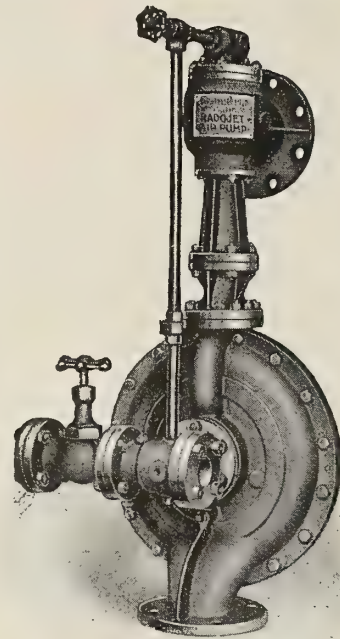
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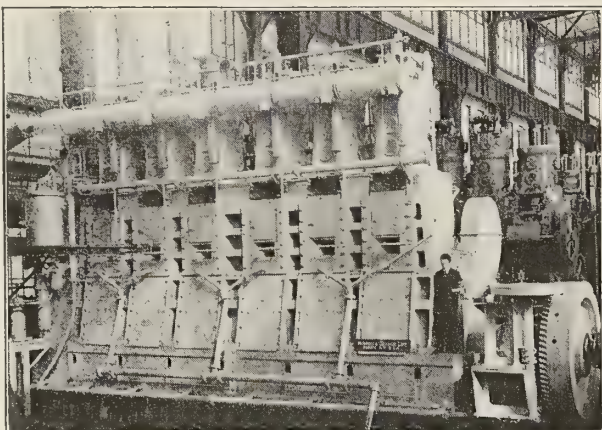
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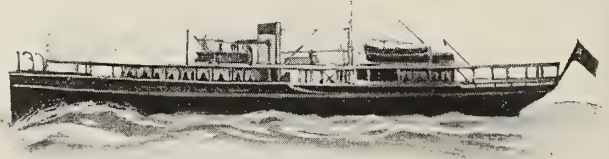
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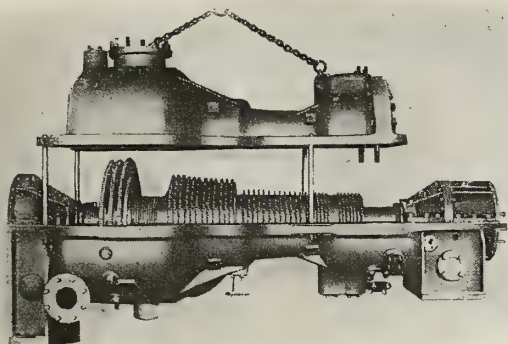
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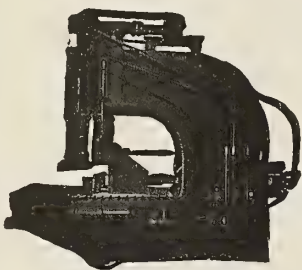
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Baltimore Dry Docks & Shipbuilding Co.
Bath Iron Works.
Bethlehem Shipbuilding Corp.
Charleston Dry Dock & Machine Co.
Consolidated Shipbuilding Corp.
Foster Marine Boiler Corp.
Heine Safety Boiler Co.
Hyde Windlass Co.
Johnson Iron Works, Ltd.
Kearfott Engineering Co.
Lake Erie Boiler Works.
New York Engineering Co.
Staten Island Shipbuilding Co.
Vulcan Iron Works, Inc.
Ward, Charles, Eng. Works.

Boiler Compounds
Waycott, A. K.

Boiler Coverings
(See Non-Conducting Coverings)

Boiler Expanders
Watson-Stillman Co.
Williams, Wm. E.

Boiler Feeders
(See Feed-water Regulators)

Boiler Feed Pumps
(See Pumps)
Alberger Pump & Condenser Co.
Davidson Co., M. T.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Kerr Turbine Co.
Warren Steam Pump Co.
Williams, Wm. E.

Boiler Flue Cleaners
The Diamond Power Specialty Co.
Maritime Engineering & Sales Corp.
Williams, Wm. E.

Boiler Gauge Glasses
(See Gauge Glasses)

Boiler Makers' Test Pumps
(See Test Pumps)



Good Ships Deserve Viking Marine Engine Oil

VIKING Marine Engine Oil — for thrust bearing and reciprocating engine lubrication—is the latest development among the Sun Marine Oils. It conforms in efficiency with the high standards maintained for years in the famous Sun XX Marine Oil.

Viking Engine Oil, by reason of a special patented refining process, will form a perfect and lasting emulsion with either salt or fresh water.

The body of this emulsion may be varied from a heavy pastelike substance to any consistency by the simple addition of a larger percentage of water.

For lubrication of thrust bearings an emulsion of Viking Oil with from 50 to 75 per cent water is recommended.

When used for main bearings without the addition of water, Viking Oil has high viscosity and extremely low internal frictional values. It will absorb any water that may find its way into the bearings and will feed indefinitely through a wick without clogging the pores.

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The Sun Company has specialized for a quarter century in lubricating oils. It has developed into an organization of lubrication experts, its aim being to supply accurate and efficient lubrication instead of just "oil."

The choice of a lubricant for any particular purpose demands expert advice. Engineers of the Sun Company are available to make an analysis of your lubrication requirements and specify the right oils to meet them. This service is free.

SUN COMPANY

*Producer and Refiner of Lubricating Oils, Fuel Oil, Gas Oil, Gasoline
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Boiler Rivets (See Rivets)	Bunks Southern-Rome Co.	Castings—Brass Charleston Dry Dock & Machine Co. Crane Co. Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co., The Powell Co., The William Sands, A. B., & Son Co. Tiebout, W. & J. Williams, Wm. E.	Chain Valve Wheels Lunkenheimer Co., The Powell Co., The William	Cocks (See Gauge Cocks)
Boiler Riveters (See Power Riveters)	Buoys Williams, Wm. E.	Castings—Bronze American Manganese Bronze Co. American Steel Foundries Charleston Dry Dock & Machine Co. Chase Metal Works Chase Rolling Mill Co. Columbian Bronze Co. Crane Co., The Ferguson-Herbert Corp'n Lunkenheimer Co., The Powell Co., The William Sands, A. B., & Son Co. Tiebout, W. & J. Williams, Wm. E.	Channels Pollak Steel Co.	Combined Air and Circulating Pumps Wheeler Mfg. Co.
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Boiler Staybolts (See Staybolts)	Burners, Fuel Oil (See Fuel Oil Burners)	Castings—Steel American Steel Foundries Bethlehem Shipbldg. Corp. Chase Metal Works Chase Rolling Mill Co. Crane Co., The Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co., The National Malleable Cast- ings Co. Sands, A. B., & Son Co.	Check Valves—Brass and Iron Crane Co., The Lunkenheimer Co., The Mott Iron Works, J. L. Powell Co., The William Pratt & Cady Co., Inc. Sands & Son Co., A. B. Watson-Stillman Co. Williams, Wm. E.	Compasses Sperry Gyroscope Co. Williams, Wm. E.
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Boring Machines—Wood Chicago Pneumatic Tool Co. Cleveland Pneumatic Tool Co. Ingersoll-Rand Co.	Carbon Dioxide Machine Brunswick Refrigerating Co. Frick Co. York Manufacturing Co.	Centrifugal Pumps Alberger Pump & Conden- ser Co. Fairbanks-Morse Co. Ingersoll-Rand Co. Kearfott Engineering Co. Kerr Turbine Co. Westinghouse Electric & Mfg. Co. Wheeler Manufacturing Co. Williams, Wm. E.	Chock Fittings Steward Davit and Equip. Corp.	Conveying Machinery Lidgerwood Mfg. Co. McMyler Interstate Co.
Boring and Turning Mills Niles-Bement-Pond Co.	Car Dumpers Brown Hoisting Machinery Co. McMyler Interstate Co.	Chain Kearfott Engineering Co. National Malleable Cast- ings Co.	Chucks Chicago Pneumatic Tool Co. Ingersoll-Rand Co. Keller Pneumatic Tool Co. Williams, Wm. E.	Conveyors (Coal) (See Conveying Machinery)
Brazing Materials. Smooth-On Mfg. Co.	Car Floats American Bridge Co.	Chain Hoists and Blocks Niles-Bement-Pond Co. Union Hardware Co. Williams, Wm. E. Yale & Towne Mfg. Co.	Circular Shears The Quickwork Co.	CO₂ Ice Machines (See Conveying Dioxide Machines)
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Brass Castings (See Castings—Brass)	Cargo Lights General Electric Co. Williams, Wm. E.		Circulators (See Boiler Circulators)	
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Brick (See Fire Brick)			Clinch Rings Williams, Wm. E.	
Bridge Control Westinghouse Electric & Mfg. Co.			Clocks Ashton Valve Co. Williams, Wm. E.	
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IS THE ONLY CHAIN MADE WITH LINK AND STUD ONE SOLID PIECE.

It is greater in strength, more uniform in size and shape, and easier of operation than any other type of anchor chain cable.

The studs in “Naco” links being cast of the same metal and integral with the link (not inserted afterward), can never be lost or even loosened. THIS IS the greatest safeguard against kinking, and an assurance of smooth operation in service.

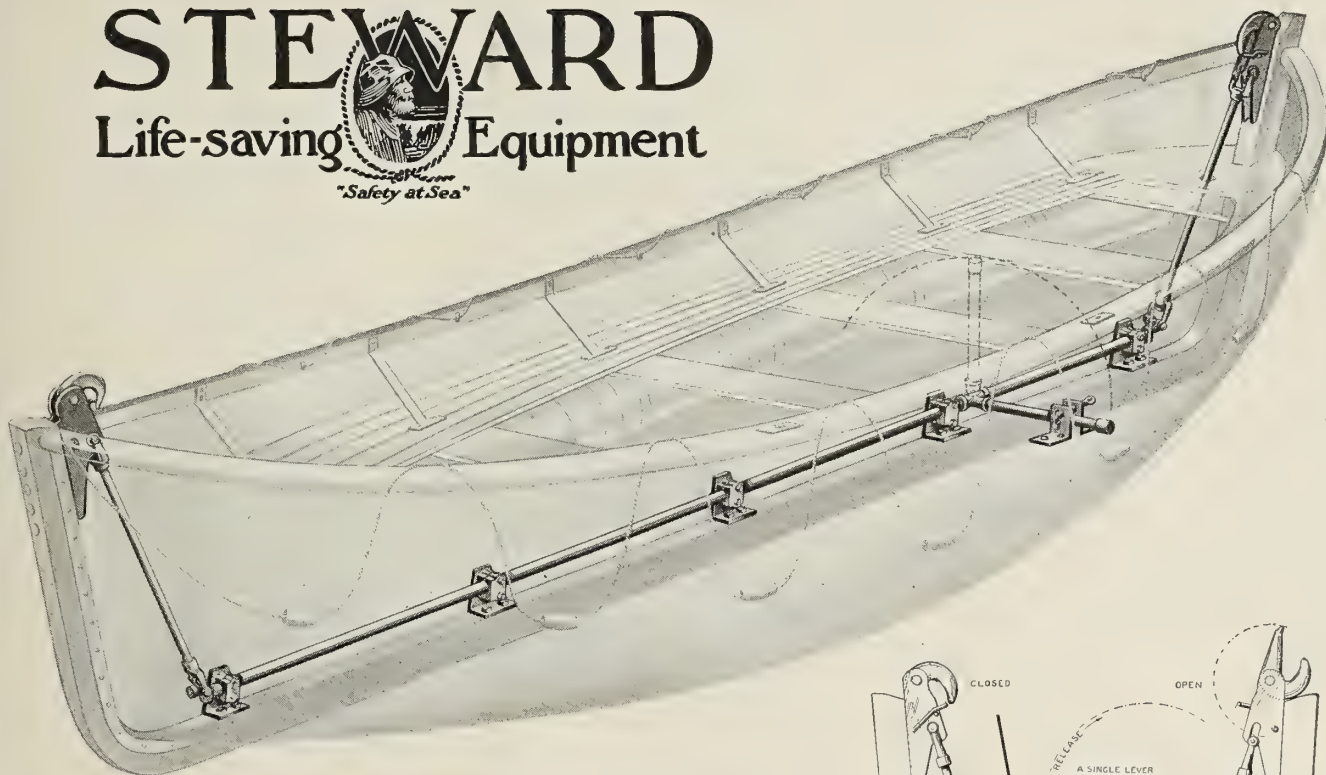
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Copper Tubes, Rods, Wires Chase Metal Works Chase Rolling Mill Co. Williams, Wm. E.	Decking Long-Bell Lumber Co. Marine Decking & Supply Co.	Drills, Pneumatic (See Pneumatic Tools)	Electric Lighting General Electric Co.	Engines for Auxiliaries Consolidated Shipbuilding Corp. De Laval Steam Turbine Co. Fairbanks-Morse Co. Hyde Windlass Co. Kearfott Engineering Co. Kerr Turbine Co. McIntosh & Seymour Corp. New London Ship & Engine Co. Westinghouse Electric & Mfg. Co.
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Corrugated Furnaces Continental Iron Works, The	Derrick Cars McMyler Interstate Co.	Drills, Wall Radial (See Radial Drills)	Electric Plants Consolidated Shipbuilding Corp. Fairbanks-Morse Co. General Electric Co. Kerr Turbine Co. Westinghouse Electric & Mfg. Co.	Engines, Hoisting (See Hoisting Engines)
Counters (See Revolution Counters)	Derrick Irons Lidgerwood Mfg. Co. J. S. Mundy Hoisting Engine Co.	Drop Forgings (Eye Bolts, Wrenches, Etc.) Pollak Steel Co. Williams & Co., J. H. Williams, Wm. E.	Electric Pumps (See Electric Driven Pumps)	Engines, Kerosene (See Kerosene Engines)
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Cranes (Also see Floating Cranes and Shipyards Whirlers) American Balsa Co. American Engineering Co. Brown Hoisting Machinery Co. Chambersburg Engineering Co. McMyler Interstate Co. Niles-Bement-Pond Co. Shepard Electric Crane & Hoist Co.	Die Blocks Pollak Steel Co.	Dry Docks (Manufacturer and Marine Railways) Bethlehem Shipbldg. Corp. Crandall Engineering Co.	Electrical Instruments General Electric Co. Williams, Wm. E.	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.
Crank Shafts Pollak Steel Co. Williams & Co., J. H.	Dies Brubaker & Bros., W. L. Cleveland Punch & Shear Works Co. Williams, Wm. E.	Dry Docks and Marine Railways Baltimore Dry Docks & Shipbuilding Co. Bethlehem Shipbuilding Corp., Ltd. Charleston Dry Dock & Machine Co. Merchant Shipbuilding Corp. Newport News Shipbuilding & Dry Dock Co. Pensacola Shipbuilding Co. Shewan & Son, James, Co. Staten Island Shipbuilding Corp. Alex. Stephen & Sons, Ltd. Sun Shipbuilding Co. Todd Shipyards Corp. Yarrow & Co., Ltd.	Electrical Wiring Devices (Switches, Sockets, Etc.) Williams, Wm. E.	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.
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Cutters Williams, Wm. E.	Direct-Connected Sets (See Electrical Plants)	Eccentric Rods Pollak Steel Co.	Engine Logs Williams, Wm. E.	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.
Cutting Compounds Williams, Wm. E.	Disengaging Gears American Balsa Co. Steward Davit & Equip. Corp.	Economizer, Fuel (See Fuel Economizer)	Engine Oil (See Lubricants)	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.
Cutting and Welding (See Welding)	Dock Fittings Williams, Wm. E.	Ejectors Lunkenheimer Co. Williams, Wm. E.	Engine Packing (See Packing)	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.
Cylinder Boring Bars Niles-Bement-Pond Co. Williams & Co., J. H.	Draft Gauges Pneumercator Co. Williams, Wm. E.	Electric Cutouts Chicago Fuse Mfg. Co.	Engine Room Counters (See Revolution Counters)	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.
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Deck Fittings Steward Davit & Equip. Corp. Williams, Wm. E.	Drilling Machines Niles-Bement-Pond Co.	Electric Freight Trucks (See Freight-Handling)	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.
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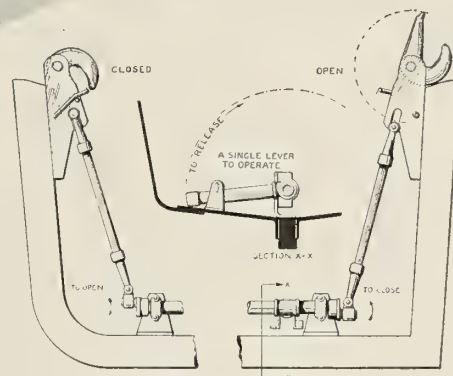
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STEWARD BOAT RELEASING GEAR

Approved by U. S. Steamboat Inspection Service
British Board of Trade and Requirements
of Other Governments

PATENTED IN U. S. A. AND FOREIGN COUNTRIES



Detail of Operation

READILY INSTALLED IN NEW OR OLD BOATS

To operate the Steward Boat Releasing Gear a single lever is thrown over, revolving the shaft and releasing in less than a half turn. There are no chains, wires or thin bars in tension or compression; accidental release is impossible.

The action is positive and can only be done with deliberation, but is so simple that in emergency any one can safely release a lifeboat full of people. The leverage is so powerful that very little effort is required even when the boat is not waterborne.

The falls may be instantly attached to the hooks without moving the lever and cannot drop out when slack; they may be disengaged just as readily if desired.

It has been the experience of practical seamen that the Steward Releasing Gear solves the problem of clearing away a boat in a seaway. No matter how high the sea you can release both ends instantly when the word is passed. One turn of the lever and the boat is afloat.

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LIFE BOATS

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Expanders (See Boiler Flue Expanders and Pipe Expanding and Flanging Machines)	Floating Dry Docks (See Dry Docks)	Furnace Fronts Continental Iron Works, The	Gauges—Manufacturers' (Also see Steam Gauges)	Gyro-Stabilizers. Sperry Gyroscope Co.
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Eye Bolts Williams & Co., J. H. Williams, Wm. E.	Flue Cleaners (See Boiler Flue Cleaners)	Fusible Plugs Crane Co., The Griscom-Russell Co. Lunkenheimer Co., the Williams, Wm. E.	General Welding and Cutting Equipment (See Welding & Cutting Apparatus and Supplies)	Hammers Bradley & Son, C. C.
Fans (See Blowers)	Flue Cutters (See Boiler Flue Cutters)	Fuses, Enclosed Cartridge. Chicago Fuse Mfg. Co.	Generating Sets Engberg's Electric & Mechanical Wks. Fairbanks-Morse Co. General Electric Co. Kerr Turbine Co. Westinghouse Electric & Mfg. Co. Williams, Wm. E.	Hammers, Pneumatic (See Pneumatic Tools)
Feed Water Heaters Alberger Pump & Condenser Co. Griscom-Russell Co. Kearfott Engineering Co. Pratt & Cady Co., Inc. Row & Davis, Engineers, Inc. Williams, Wm. E.	Flue Hole Punches and Dies Cleveland Punch & Shear Works Co.	Galley Pumps Mott Iron Works, J. L. Sands & Son Co., A. B. Williams, Wm. E.	Generators Engberg's Electric & Mechanical Wks. Fairbanks-Morse Co. General Electric Co. Williams, Wm. E.	Hammers, Steam Chambersburg Eng. Wks. Niles-Bement-Pond Co.
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Fences (See Wire Fences)	Forced Draft (See also Blowers) De Laval Steam Turbine Co. General Electric Co. Kearfott Engineering Co. Kerr Turbine Co.	Gantry Cranes Niles-Bement-Pond Co.	Glue—Marine Williams, Wm. E.	Handles (Crank, Balance, Machine) Williams & Co., J. H.
Ferrules—Condenser Tube (See Condenser Tube Ferrules)	Forges C. C. Bradley & Son Buffalo Forge Co.	Gas Compressors Norwalk Iron Works	Governors Cory, Chas., & Sons, Inc.	Hardware (See Marine Hardware)
Files Williams, Wm. E.	Forgings, Bronze Hyde Windlass Co. Pollak Steel Co.	Gas Engine Specialties Crane Co., The Lunkenheimer Co., The Powell Co., The William Pratt & Cady Co., Inc.	Globe Valves—Brass and Iron Crane Co., The Lunkenheimer Co., The Powell Co., The William Pratt & Cady Co., Inc. Williams, Wm. E.	Hardwood (See Lumber)
Filters—Marine Oil Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc. Williams, Wm. E.	Forgings—Drop (See Drop Forgings)	Gaskets (Also see Packing) Crane Co., The Goetze Gasket & Packing Co. Griscom-Russell Co. Smooth-On Mfg. Co. Williams, Wm. E.	Governor Valves Crane Co., The Lunkenheimer Co., The Williams, Wm. E.	Hawse Pipes Ferguson-Herbert Corp'n
Fire Alarm Systems Aero Alarm Co. Kidde Co., Inc., Walter	Forgings, Iron and Steel (Also see Drop Forgings) Charleston Dry Dock & Machine Co. Pollak Steel Co.	Gasoline Engines Consolidated Shipbuilding Corp. Fairbanks-Morse Co. Standard Motor Construction Co. Winton Engine Co.	Governors Cory, Chas., & Sons, Inc.	Hawser Reels Williams, Wm. E.
Fire Department Supplies Kidde Co., Inc., Walter	Freight-Handling Equipment Brown Hoisting Machinery Co. General Electric Co. Lidgerwood Mfg. Co. McMyler Interstate Co. Shepard Electric Crane & Hoist Co.	Gasoline Pumps Sands & Son Co., A. B.	Grate Bars Ferguson-Herbert Corp'n	Hawsers—Manila (Also see Rope and Wire Rope) American Mfg. Co. Columbian Rope Co. Plymouth Cordage Co. Whitlock Cordage Co. Williams, Wm. E.
Fire Extinguishers Kidde Co., Inc., Walter Williams, Wm. E.	Fuel Economizer Griscom-Russell Co. Magnesia Association of America	Gate Valves — Brass and Iron Powell Co., The William Crane Co., The Lunkenheimer Co., The Pratt & Cady, Inc. Williams, Wm. E.	Grease (See Lubricants)	Heat Insulation (Also see Non-Conducting Coverings) American Balsa Co. Magnesia Association of America
Fire Hose (See Hose)			Grease Cups Crane Co., The Lunkenheimer Co., The Powell Co., The William Sun Co.	Heaters (Bath, Lavatory, Shower) Alberger Pump & Condenser Co. Griscom-Russell Co. Kearfott Engineering Co. Mott Iron Works, J. L. Pratt & Cady Co., The Sands & Son Co., A. B. Williams, Wm. E.
Fireproof Lumber (See Lumber, Fireproof)				Hemp (See Twine)
Fire Pumps Alberger Pump & Condenser Co. Warren Steam Pump Co.				Hoist Hooks Williams, J. H., & Co. Williams, Wm. E.
				Hoisting Engines Allan-Cunningham Co. American Engineering Co. Fairbanks-Morse Co. Flory Manufacturing Co., S. Hadfield-Penfield Steel Co. Hyde Windlass Co. Lidgerwood Mfg. Co. Maritime Engineering & Sales Corp.



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Boston *Charleston
*Philadelphia *New Orleans
*Baltimore *Baton Rouge

Pacific Coast Ports

Tacoma *San Francisco
*Seattle *San Pedro
*Point Wells *San Diego
Astoria *Honolulu
*Richmond

CANADA

*Halifax *Vancouver
*Montreal Prince Rupert
*Levis (Quebec)

MEXICO

Tampico

PANAMA CANAL

Cristobal *Balboa

WEST INDIES

Havana Bermuda
Cienfuegos Curacao
Nuevitas St. Thomas
San Juan

SOUTH AMERICA

Rio de Janeiro Montevideo
*Buenos Aires Valparaiso
*Campana *Talara

*Diesel oil also available

UNITED KINGDOM

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*Manchester *Brixham
*Southampton *Hull
*Newcastle-On-Tyne
*Sunderland *Thames Haven

GERMANY

Hamburg Nordenham

AFRICA

Bizerta

TURKEY

Constantinople

GREECE

Piraeus

CHINA

Hong Kong Shanghai

JAPAN

Itosaki Nagasaki

*Arrangements will shortly be completed to cover ports
in addition to those listed, as follows:*

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Fort William, Ont.
Hamilton, Ont.
Sarnia, Ont.
Quebec (P. Q.)
St. John, N. B.
Victoria, B. C.
Antilla, Cuba
Matanzas, Cuba
Antofagasta, Chile
Iquique, Chile

Pisagua, Chile
Tocopilla, Chile
Taltal, Chile
Paíta, Peru
Callao, Peru
Bahia Blanca, Arg.
Ponta Delgada, Azores
Trondhjem, Norway
Bergen, Norway
Christiania, Norway
Vallo, Norway

Gothenburg, Sweden
Helsingfors, Finland
Aalborg, Denmark
Copenhagen, Denmark
Nyborg, Denmark
Avonmouth, U. K.
Birkenhead, U. K.
Cardiff, U. K.
Rotterdam, Holland
Amsterdam, Holland
Antwerp, Belgium

Rouen, France
Havre, France
Marseilles, France
Dunkirk, France
La Pallice, France
Genoa, Italy
Monopoli, Italy
Portici, Italy
Savona, Italy
Venice, Italy

Salonica, Greece
Bourgas, Bulgaria
Smyrna, Turkey
Port Said, Egypt
Alexandria, Egypt
Colombo, Ceylon
Singapore, S. S.
Sydney, Australia
Wellington, N. Z.
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Hoisting and Transmission Rope (See Rope)	Interlocking Rubber Tiling Griscom-Russell Co.	Lights, Electric (See Electric Lights)	Marine Engineers (See Engineers, Consulting)	Mica Top Fuse Plugs Chicago Fuse Mfg. Co.
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Hoists, Electric (See Electric Hoists)	Iron Pipe (See Pipe)	Loading and Unloading Equipment (See Freight-Handling Equipment)	Marine Glue Williams, Wm. E.	Mineral Wool (See Non-Conducting Covering)
Holders-On Chicago Pneumatic Tool Co. Ingersoll-Rand Co.	Iron Rust Remover The Rust Products Co.	Locks and Latches (See Ship Locks and Latches)	Marine Hardware Consolidated Shipbuilding Corp. Sands & Son Co., A. B. Tiebout, W. & J. Williams, Wm. E.	Mooring Engines American Engineering Co. Flory Mfg. Co., S. Hyde Windlass Co. Lidgerwood Mfg. Co.
Hollow Boring Pollak Steel Co.	Jacks (Pneumatic) Gracey, R., & Sons Co. Watson-Stillman Co.	Locomotive Cranes (See Cranes)	Marine Heaters (See Heaters)	Motor Boats (See Launches and Yachts)
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Hose (Also see Air Hose) Chicago Pneumatic Tool Co. Ingersoll-Rand Co. U. S. Rubber Co.	Journal Bearings (See Thrust Bearings)	Lowering Control American Balsa Co.	Marine Paint (Also see Paint) Briggs Bituminous Composition Co., Inc. Federal Composition & Paint Co., Inc. Wadsworth, Howland & Co. Wailles Dove - Hermiston Corp. Williams, Wm. E.	Motors, Electric General Electric Co.
Hose Coupling Chicago Pneumatic Tool Co. Cleveland Pneumatic Tool Co. Ingersoll-Rand Co. U. S. Rubber Co.	Jute American Mfg. Co. Columbian Rope Co.	Lubricants Standard Oil Co. (New Jersey) Sun Co. Wadsworth, Howland & Co.	Marine Plumbing Crane Co., The Mott Iron Works, J. L. Sands & Son Co., A. B.	Motors, Gasoline (See Gasoline Engines)
	Kerosene Engines Consolidated Shipbuilding Corp. Fairbanks-Morse Co. Standard Motor Construction Co.	Lubricating Oil Pumps Warren Steam Pump Co.	Marine Railway Builders Crandall Engineering Co.	Multiple Drills Niles-Bement-Pond Co.
	Ladder Treads Williams, Wm. E.	Lubricators Crane Co. Griscom-Russell Co. Lunkenheimer Co. Powell Co., The William Sun Co.	Marine Railways (See Dry Docks)	Multiple Punches Cleveland Punch & Shear Works Niles-Bement-Pond Co.
Humidifiers Griscom-Russell Co.	Lamps, Signals and Fixtures General Electric Co. Sands, A. B. & Son Co. Westinghouse Electric & Mfg. Co. Williams, Wm. E.	Machine Tools Cleveland Pneumatic Tool Co. Cleveland Punch & Shear Works Co. Niles-Bement-Pond Co.	Marine Ranges (See Ranges)	Multiwhirl Oil Coolers Griscom-Russell Co.
Hydraulic Fittings Crane Co., The Lunkenheimer Co. Powell Co., The William Watson-Stillman Co.	Lathe Dogs Williams & Co., J. H. Williams, Wm. E.	Machinists' Tools Williams & Co., J. H.	Marine Refrigeration (See Refrigerating Machinery)	Nautical Instruments McNab Co., The Sperry Gyroscope Co. Williams, Wm. E.
Hydraulic Presses and Other Machinery Chambersburg Engineering Co. Niles-Bement-Pond Co. Warren Steam Pump Co. Watson-Stillman Co.	Lathes, Crank Shaft, Engine and Turret Niles-Bement-Pond Co.	Manganese Bronze Castings American Manganese Bronze Co. Columbian Bronze Corp. Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co. Powell Co., The William	Marine Repairs (See Shipbuilders)	Naval Architects Bogert, John L. Cathcart, Wm. L. Chapman & Fisher Cox & Stevens Donnelly, William T. Ferris, Theodore Jacobs Co., J. L. Haag, A. H. Haight, Robert S. Hansen, Max Harris, Leonard B. McClelland, N. E., & Co., Ltd. McKinlay, James Matthews, John B. Nilson, Leonard J. Peerless Eng. Co. Rimmer, A. C. Russell & Thayer Sharp, Geo. G. Tams, Lemolne & Crane Watts, J. Murray Whittelsey & Whittelsey
Hydrometers Taylor Instrument Companies	Launches and Yachts (See shipbuilders)	Magnesia Goods and Materials Magnesia Association of America	Marine Securities Marine Corporation	
Hydrodeiks Taylor Instrument Companies	Launching Grease Sun Co.	Malleable and Steel Castings Crane Co.	Marine Shafting (See Shafting)	Needle Valves (See Valves)
Hygrometers Taylor Instrument Companies	Lavatories (Stateroom) Crane Co., The Mott Iron Works, J. L. Sands, A. B., & Son Co. Williams, Wm. E.	Manila and Sisal Rope (See Rope)	Marine Specialties (See Steam Specialties)	Nipples Crane Co., The Lunkenheimer Co., The
Ice Machines (See Refrigerating Machinery)	Lavatory and Bath Heaters Griscom-Russell Co. Sands, A. B., & Son Co. Williams, Wm. E.	Manifolds Cleveland Pneumatic Tool Co.	Marine Superheaters Babcock & Wilcox Co. Heine Safety Boiler Co. Power Specialty Co. Superheater Co., The	Non-Conducting Coverings Magnesia Association of America Thorsen, P. S., & Co., Inc.
Indicator Connections Lunkenheimer Co. Powell Co., The William	Lead Pencils (See Drawing Pencils)	Manufacturing Plants (See Builders)	Marine Supplies Tiebout, W. & J. Williams, Wm. E.	Non-Toppling Blocks American Balsa Co.
Indicators (Steam and Gas Engine) Ashton Valve Co. Lunkenheimer Co., The Powell Co., The William Williams, Wm. E.	Leather Belting Williams, Wm. E.	Marine Boiler Heads (See Boiler Heads)	Marine Wiring Devices General Electric Co.	Nozzles (See Hose Nozzles)
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		Marine Engines (See Engines, Propelling)	Meters, Electric General Electric Co.	

What Balsa Insulation Means to the Shipowner and Shipbuilder

BALSA insulation, economical in maintenance of refrigerated ship spaces and practical in the simplicity of its installation, provides the solution for the many difficulties heretofore encountered in construction and upkeep. By the use of Balsa full insulating values are maintained, without replacement, year after year; there is a saving of as much as fifty percent of the weight of the insulating structure; thinner walls increase the available cargo space; and the original cost of the completed structure is less than with other good materials.



In the last eighteen months more than a million board feet of Balsa insulation have been installed following the thorough development of its use during the last ten years. Methods of treatment that retain the high insulating value of this lightest of all woods, have been fully proven. Standard plans of installation have been established. Balsa has met successfully all those tests and conditions to which an extended period of actual use has subjected it. Its use has brought about a new appreciation of the possibilities of economical ship insulation.

ADVANTAGES OF Balsa SHIP INSULATION

- 1 Balsa is supplied in large panels having a structural strength fully half that of spruce.
- 2 Balsa requires little studding and only a single layer of sheathing for surface protection.
- 3 Its resistance to heat transmission is equal to that of other high grade insulating materials.
- 4 Balsa is even lighter than cork, and the weight of a completed installation is fully 50% less.
- 5 Permanence of structure and of insulating efficiency is obtained through exclusion of moisture.
- 6 Balsa panels are easily installed, a small number of tight fitting joints minimizing heat leakage.
- 7 Removable sections can be installed to permit ready inspection of ship's hull for painting or repairs.
- 8 Metal sheathed Balsa panels are available for insulation of boiler room hatches and crew quarters.

An article which appeared in the July, 1921, issue of International Marine Engineering, describing Balsa ship insulation, and including detailed drawings showing standard plans of installation, has been reprinted for distribution to those interested. May we send you a copy of this article?

American Balsa Company Inc.
305 Vernon Ave., Long Island City, New York

Oakum American Balsa Co. American Mfg. Co. Stratford Oakum Co., George	Packings, Leather Watson-Stillman Co.	Plate-Bending Rolls (See Rolls, Bending & Straightening)	Power Shears Buffalo Forge Co. Cleveland Punch & Shear Works Co. Niles-Bement-Pond Co. Quickwork Co.	Punching and Shearing Machines (See Power Machines and Shears)
Oil (See Lubricants)	Paint Federal Composition & Paint Co. Marine Decking & Supply Co. Wadsworth, Howland & Co. Wailles Dove-Hermiston Corp. Williams, Wm. E.	Plate Castors (See Castors)	Presses (See Hydraulic Presses)	Punch Tables (See Spacing Tables)
Oil Burners, Fuel (See Fuel Oil Burners)	Paint Spraying Equipment (See Pneumatic Paint Spraying Equipment)	Plate Shears The Quickwork Co.	Pressure Regulators Ashton Valve Co. Crane Co. Lunkenheimer Co., The Powell Co., The William	Pyrometers Superheater Co., The Taylor Instrument Com- panies Williams, Wm. E.
Oil Burning Equipment Bethlehem Shipbldg. Corp. Pommer, Walter C. White Fuel Oil Engineering Corp. Williams, Wm. E.	Panelling (Marine Fireproof) Marine Decking & Supply Co.	Plates (See Steel Plates and Shapes)	Professional Cards Aero Alarm Co. Ansell & Bailey Bogert, John L. Bonner, William T. Cathcart, Wm. L. Chapman & Fisher Ferris, Theodore Jacobs Co., J. L. Haag, A. H. Haight, Robert S. Matthews, John B. McClelland, N. E., & Co., Ltd. Nilson, Leonard J. Pommer, Walter E. Tams, Lemoine & Crane Peerless Eng. Co. A. C. Rimmer Russell & Thayer Sharp, Geo. G. Watts, J. Murray Whittelsey & Whittelsey	Quadrant Davits (See Davits)
Oil Coolers Alberger Pump & Condenser Co. Griscom-Russell Co.	Partitions (Marine Fireproof) Marine Decking & Supply Co.	Plugs and Receptacles— Watertight Williams, Wm. E.	Projectors (See Searchlights)	Radial Drills Cleveland Punch & Shear Works Co. Niles-Bement-Pond Co.
Oil Cups Crane Co. Griscom-Russell Co. Lunkenheimer Co., The Powell Co., The William Sun Co. Williams, Wm. E.	Pencils (See Drawing Pencils)	Plumbago (Also see Graphite) Williams, Wm. E.	Propeller Shafts (See Shafting)	Radio Apparatus Radio Corporation of America.
Oil Engines (See Engines, Oil)	Phosphor Bronze Castings American Manganese Bronze Co. Columbian Bronze Corp. Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co., The	Plumbers' Tools Williams & Co., J. H. Williams, Wm. E.	Propeller Wheels American Manganese Bronze Co. Bethlehem Shipbldg. Corp. Columbian Bronze Corp. Donnelly, Wm. T. Ferguson-Horbert Corp'n Hyde Windlass Co. Kearfott Engineering Co. Trout Co., H. G.	Rafts (See Lifeboats and Rafts)
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Oil Fuel Apparatus (See Oil-Burning Equip- ment)	Pipe National Tube Co. Watson-Stillman Co. Williams, Wm. E.	Pneumatic Drills (See Pneumatic Tools)	Pumping Machinery (See Engines, Pumping)	Ranges Sands, A. B. & Sons Co.
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Oil Purifiers De Laval Separator Co. Griscom-Russell Co.	Pipe Expanding and Flanging Machines Watson-Stillman Co.	Pneumatic Separators Griscom-Russell Co.	Punches, Shears and Bar Cutters Combined Buffalo Forge Co.	Recording Instruments (Also see Steam Gauges) Taylor Instrument Com- panies
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Oiling Systems (Also see Lubricants) Lunkenheimer Co., The Powell Co., The William	Pipe Unions Crane Co. Lunkenheimer Co., The Powell Co., The William Williams, Wm. E.	Pop Safety Valves Ashton Valve Co. Crane Co. Lunkenheimer Co., The Powell Co., The William Williams, Wm. E.		Reducing Valves Crane Co. Lunkenheimer Co., The Williams, Wm. E.
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Ingersoll-Rand

Revolution Counters Ashton Valve Co. Co. Williams, Wm. E.	Rubber Goods (Also see Packing; also see Interlocking Rubber Tiling) U. S. Rubber Co. Williams, Wm. E.	Shipbuilders and Dry Dock Companies American Balsa Co. Baltimore Dry Docks & Shipbuilding Co. Bath Iron Works Bethlehem Shipbuilding Corp. Charleston Dry Dock & Machine Co. Consolidated Shipbuilding Corp. Johnson Iron Works, Ltd. Merchant Shipbuilding Corp. New London Ship & Engine Co. Newport News Shipbuilding & Dry Dock Co. New York Shipbuilding Corp. Pensacola Shipbuilding Co. Shewan & Son, James, Co. Standard Motor Construction Co. Staten Island Shipbuilding Co. Stephen & Sons, Alex., Ltd. Sun Shipbuilding Co. Todd Shipyards Corp. Vulcan Iron Works, Inc. Ward, Chas., Engineering Works Yarrow & Co., Ltd.	Shipyards Whirlers (See Cranes)	Steam Specialties (See Pumps, Valves, Gauges, Lubricators, Etc.)
Rheostats General Electric Co.	Rubber Tiling (See Interlocking Rubber Tiling)	Shipbuilding Cranes (See Cranes)	Shop Cranes (See Cranes)	Steam Superheaters (See Marine Superheaters)
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River Boats (See Shipbuilders)	Rust Cutting and Removing Fluid The Rust Products Co.	Ship Chandlers Williams, Wm. E.	Skylight Lifting Gear Tiebout, W. & J.	Steam Turbines Alberger Pump & Condenser Co. Bath Iron Works Bethlehem Shipbuilding Corp. De Laval Steam Turbine Co. General Electric Co. Hallidie Co. Kerr Turbine Co. Kearfott Engineering Co. Westinghouse Electric & Mfg. Co.
Rivets Champion Rivet Co. Severance Mfg. Co., S.	Safety Devices (See Life Saving Devices)	Ship Clocks (See Clocks)	Sleeves (See Sockets and Sleeves)	Steam Turbine Dynamos De Laval Steam Turbine Co. General Electric Co. Kerr Turbine Co. Vulcan Iron Works, Inc. Westinghouse Electric & Mfg. Co.
Rivet Busters, Rivet Clamps and Rivet Tongs Chicago Pneumatic Tool Co. Ingersoll-Rand Co.	Safety Valves (See Valves)	Ship Compositions Wailes Dove - Hermiston Corp.	Slitting Machines The Quickwork Co.	Steel Castings (See Castings, Steel)
Riveters (See Pneumatic Riveters and Power Riveters)	Sanitary Fittings (See Plumbing)	Ship Cows (See Cows)	Slotting Machines Niles-Bement-Pond Co.	Steel Pipe Crane Co. National Tube Co.
Riveting Machines, Hydraulic and Steam Power (Also see Power Riveters and Pneumatic Riveters) Chambersburg Engineering Co. Chicago Pneumatic Tool Co. Niles-Bement-Pond Co.	Sanitary Pumps Davidson Co., M. T. Sands, A. B., & Son, Co. Warren Steam Pump Co.	Ship Fittings, Supplies and Equipment Griscom-Russell Co. Williams, Wm. E.	Small Tools (See Bench Tools)	Steel Plates (See Steel Plates and Shapes)
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Rods (Brass) Chase Metal Works Chase Rolling Mill Co. Williams, Wm. E.	Screw Plates Williams, Wm. E.	Ship Locks and Lathes Tiebout, W. & J. Williams, Wm. E.	Soaps Williams, Wm. E.	Steel Shafting (See Shafting)
Rods (Steel) Pollak Steel Co.	Screw Punches Cleveland Punch & Shear Works Co.	Ship Operators International Mercantile Marine Co.	Sockets and Sleeves Pollak Steel Co. Williams, Wm. E.	Steel Tanks Heine Safety Boiler Co.
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Rolled Zinc Williams, Wm. E.	Sectional Switch Boxes Chicago Fuse Mfg. Co.	Ship Repairs (See Dry Docks and Marine Railways)	Southern Pine (See Lumber)	Steering Gears Allan-Cunningham Co. American Engineering Co. Bethlehem Shipbuilding Corp. Hadfield-Penfield Steel Co. Hyde Windlass Co. Lidgerwood Mfg. Co. Maritime Engineering & Sales Corp. National Marine Engine Works
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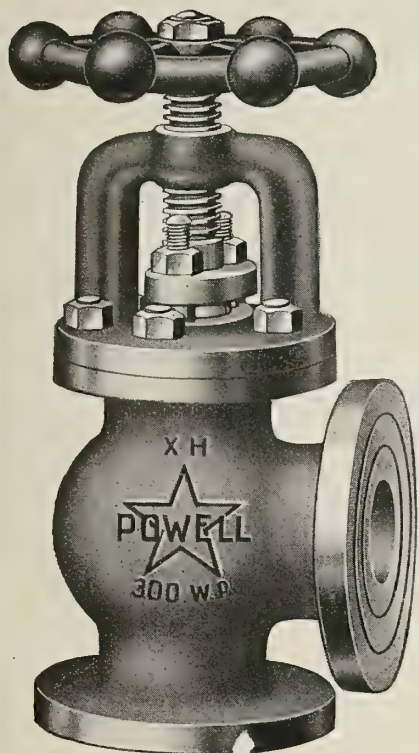
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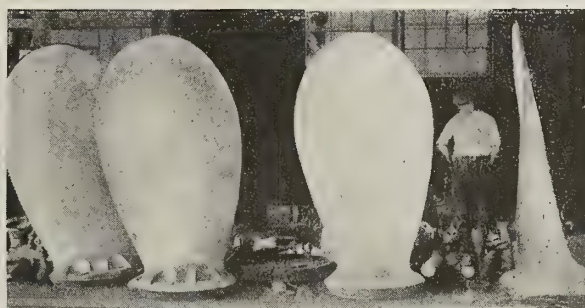
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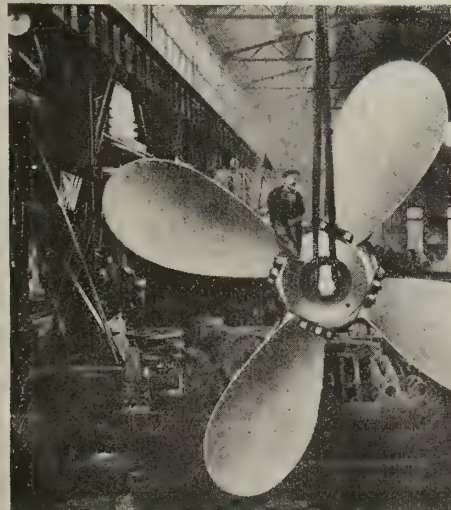
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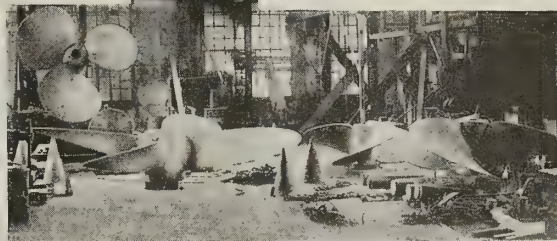
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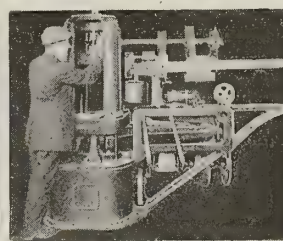
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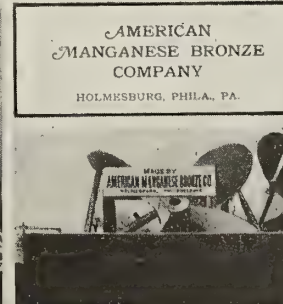


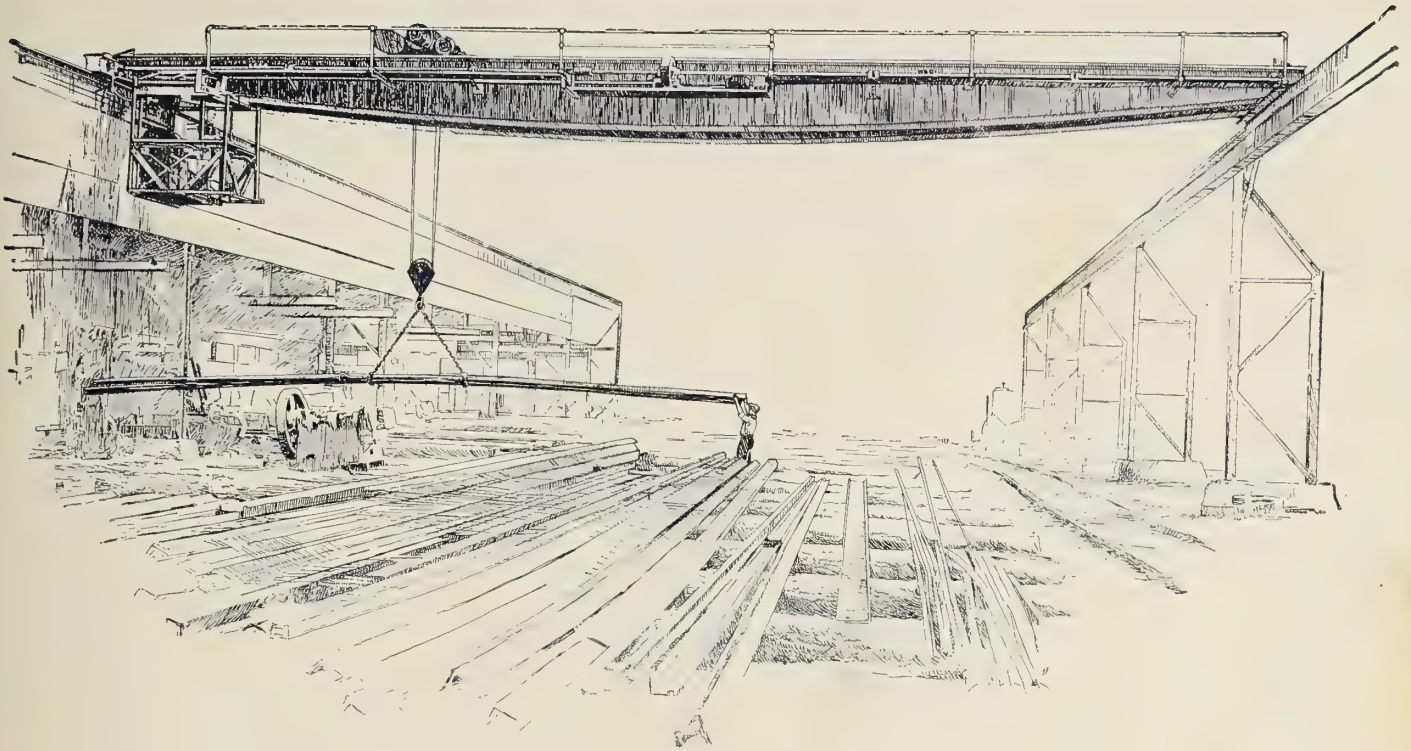
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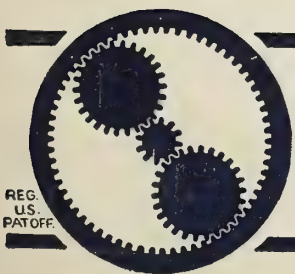
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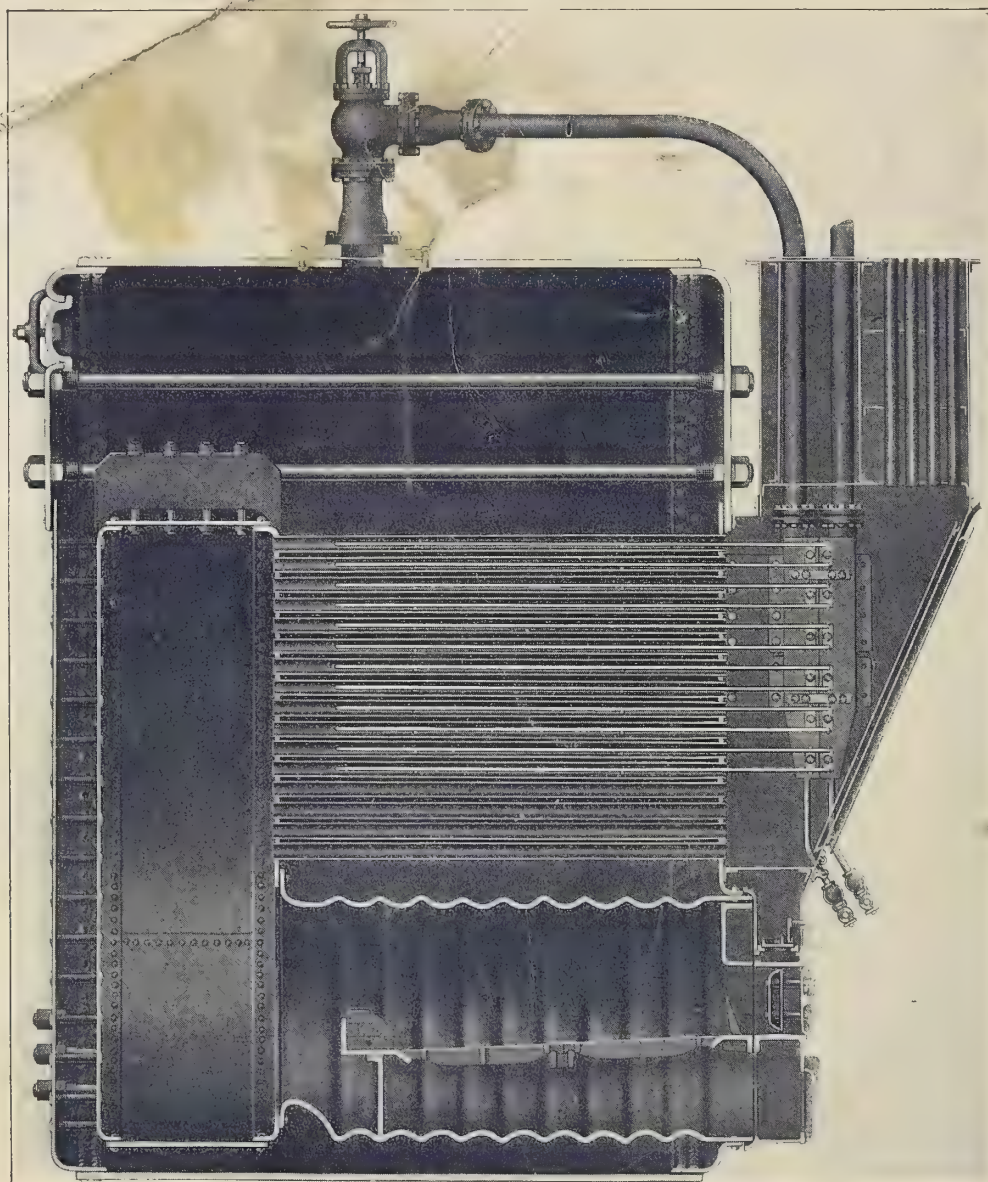
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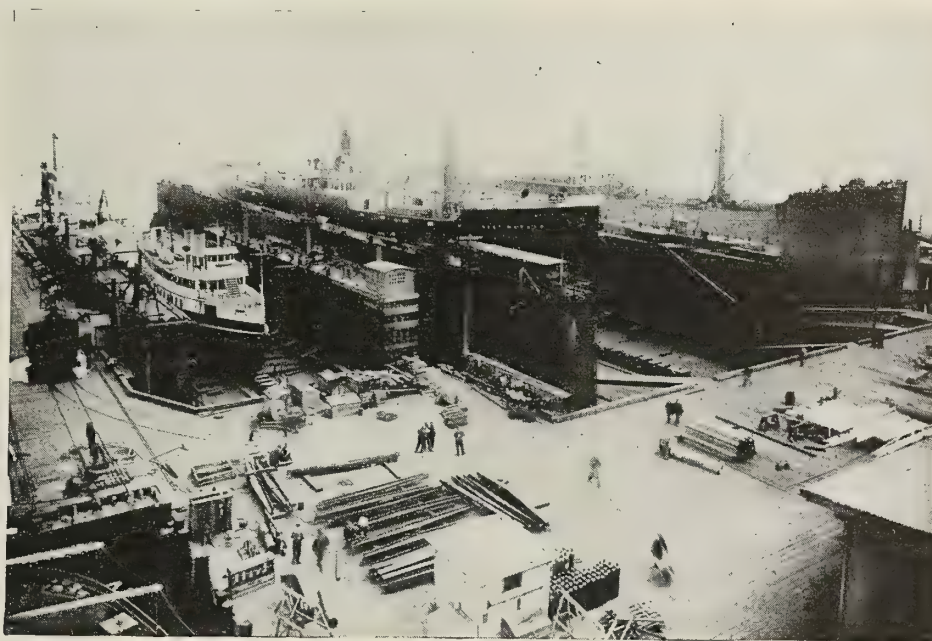
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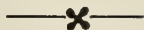
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Marine Engineering And Shipping Age

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NOVEMBER, 1921

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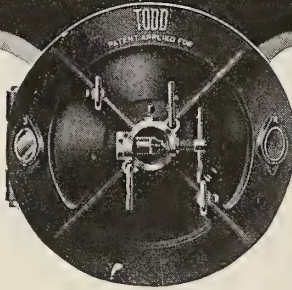
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CANADA:

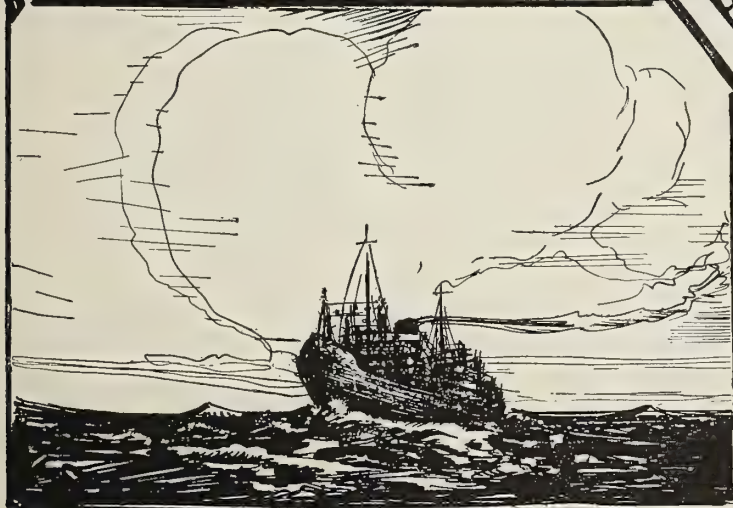
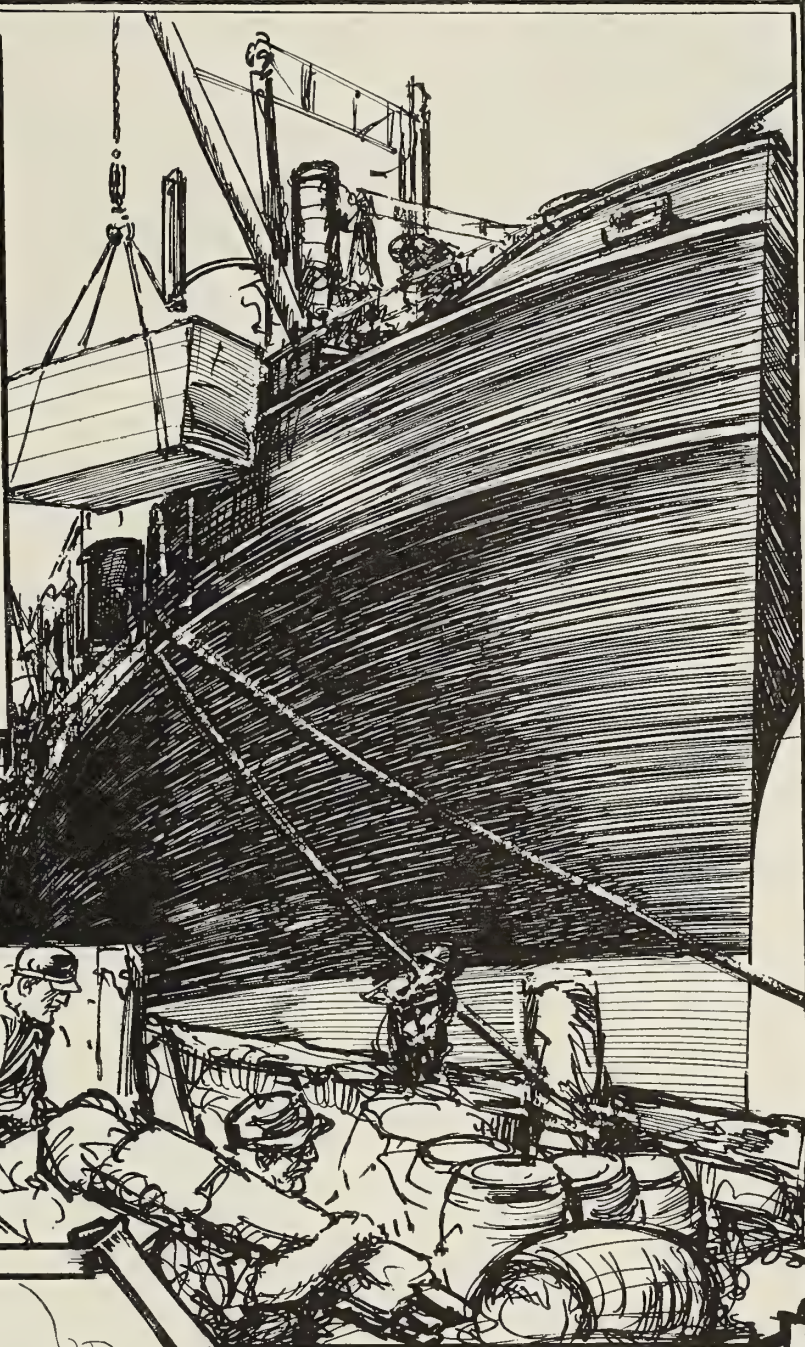
N. E. McCLELLAND & CO., Ltd

MONTREAL

TODD · SHIPYARDS · CORPORATION
— PLANT OF —
WHITE FUEL OIL ENGINEERING CORP.
ENGINEERS 742 East 12th St., New York PARSONS TURBINES
TELEPHONE — DRY DOCK 2300

□ CHARACTER □ CRAFTSMANSHIP □ SERVICE □

Quick turn-around in port is dependent on many factors, not least the character of the ship herself. Freedom from costly, time-wasting repairs, and adequate cargo-handling and fueling facilities are but two measures of this character. Records of years of continuous operation of cargo carriers and liners built by New York Ship have demonstrated that these ships invariably possess those qualities and all others which assure economy of operation.



Proper design of hull and power plant, craftsmanship in the carrying out of those designs, assure satisfactory economical performance at sea. Ships that stand up under hard-driving service year after year; that are fast where speed is needed, and low in fuel consumption; ships that meet the individual requirements of their trade; are the ships that are profitable under conditions of keen competition. Such are the ships that are built at New York Ship.

NEW YORK SHIPBUILDING CORPORATION

The Same Economy After 5 Years' Service

Due to the principles upon which Terry Turbines operate.

No. 1—Photograph of a Terry Wheel which has seen 5 years' service.

No. 2—Photograph of a new Terry Wheel for comparison.

Both of these wheels will operate with the same efficiency in spite of the fact that the one on the left has seen five years of continuous service. The arrows indicate the direction in which the steam flows with respect to the wheel. The power producing action takes place on the curved surface at the back of the bucket which we have revealed by removing a portion of the blade.

Wear on this surface, because of the complete reversal, does not alter the entrance or exit angle of the steam. Therefore, the action of the steam will remain the same as when the turbine was new, which means that the efficiency will like-wise remain unaltered.

For maintained economy and low maintenance cost

Specify Terry

THE TERRY STEAM TURBINE CO.

Terry Square, Hartford, Conn., U. S. A.

T 709

THE TERRY TURBINE

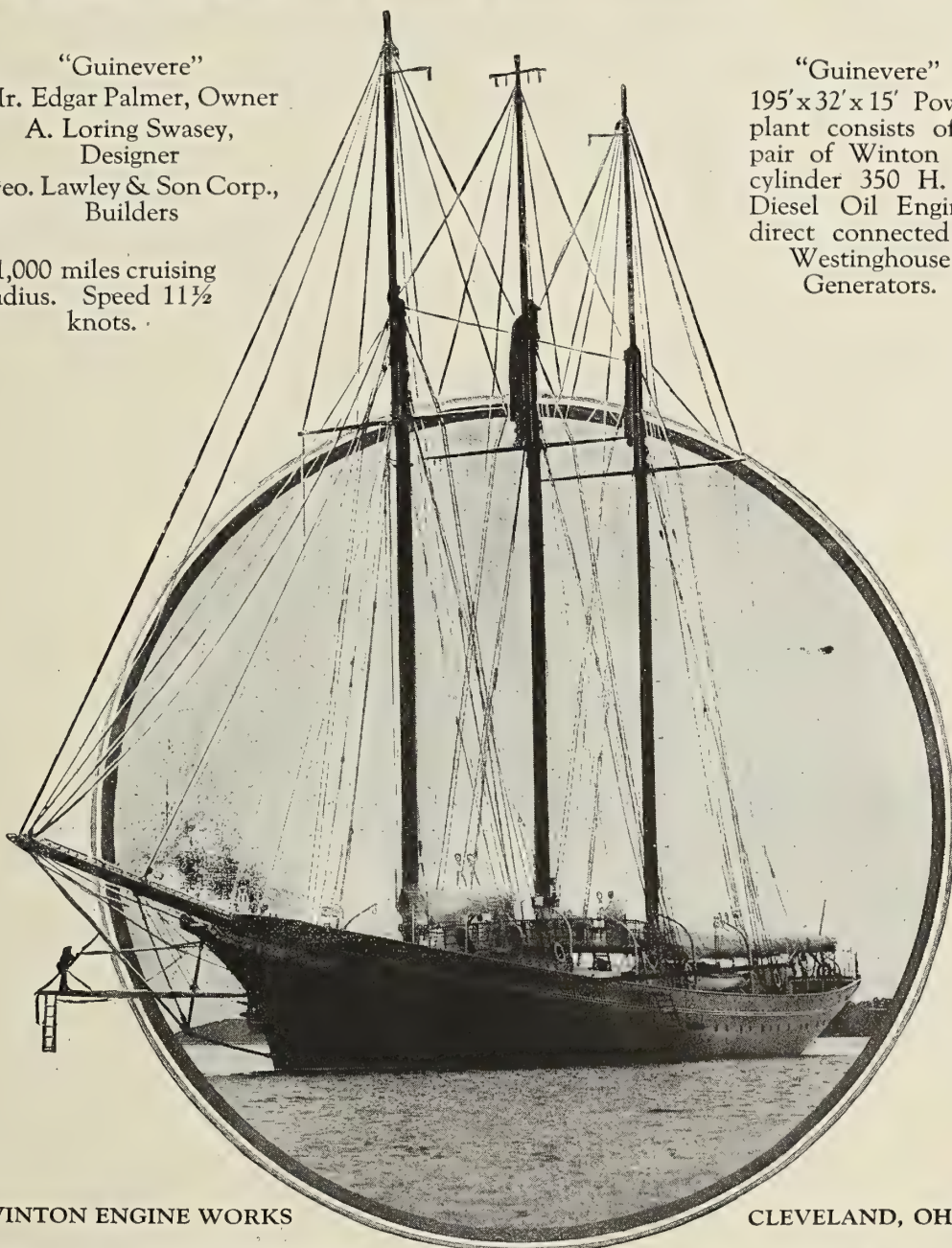
Winton

THE "Guinevere" is the latest addition to the fleet of highly successful Diesel-Electric Driven Ships to be powered with Winton Oil Engines. "Guinevere" is the largest Fore and Aft Auxiliary Schooner in the world and is also the largest Diesel powered yacht in the world.

"Guinevere"
Mr. Edgar Palmer, Owner
A. Loring Swasey,
Designer
Geo. Lawley & Son Corp.,
Builders

11,000 miles cruising
radius. Speed $11\frac{1}{2}$
knots.

"Guinevere"
195' x 32' x 15' Power
plant consists of a
pair of Winton six
cylinder 350 H. P.
Diesel Oil Engines
direct connected to
Westinghouse
Generators.



WINTON ENGINE WORKS

CLEVELAND, OHIO

BETHLEHEM

SHIP BUILDING — SHIP REPAIRING



S.S. G. HARRISON SMITH, BUILT AT SPARROW'S POINT PLANT

Bethlehem-Built 20,000-ton Combination Ore-and-Oil Vessel

Carries a Full Cargo of Either Ore or Oil—Eliminating
the Non-Profitable Return Voyage of the Ordinary Tanker

SIX PLANTS

FORE RIVER
Quincy, Mass.
MOORE
Elizabeth, N. J.
UNION
San Francisco, Cal.
HARLAN
Wilmington, Del.
SPARROW'S POINT
Sparrow's Point, Md.
REDINGTON
Redington, Pa.

THE G. HARRISON SMITH, combination ore-and-oil vessel, *Bethlehem-Built* for the International Petroleum Company, is a fine example of the ability of the Bethlehem organization to meet exceptional requirements.

Bethlehem engineers will be glad to give you the benefit of their experience in the solution of your marine problems.

PROMPT SERVICE IN MARINE REPAIR WORK

Floating Dry Dock
Quincy, Mass.
Graving Dock
Wilmington, Del.
Two Floating Dry Docks
Sparrow's Point, Md.

Three Floating Dry Docks
Two Graving Docks
San Francisco, Cal.
Two Marine Railways
Floating Dry Dock
Alameda, Cal.

BETHLEHEM SHIPBUILDING CORPORATION, Ltd.

General Offices: BETHLEHEM, PA.

Sales Offices:

New York
Boston

Philadelphia
Baltimore

Washington
Atlanta

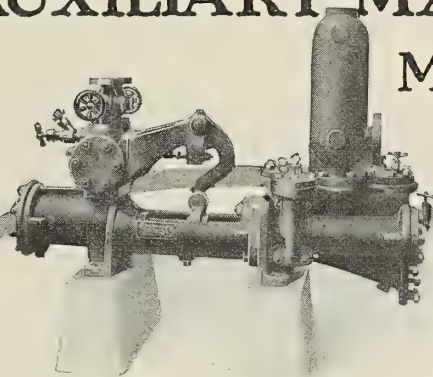
Pittsburgh
Cleveland

Detroit
Chicago

St. Louis
San Francisco

BETHLEHEM

MARINE AUXILIARY MACHINERY
OIL BURNING EQUIPMENT MARINE VALVES AND FITTINGS



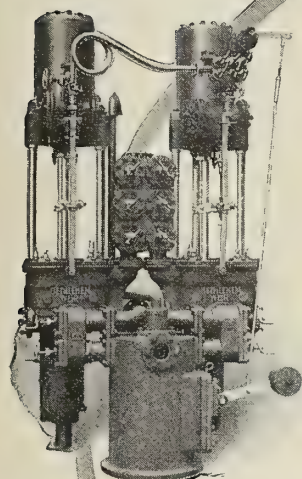
Bethlehem-Weir Fuel Oil Service Pump

RELIABLE AND ECONOMICAL MARINE EQUIPMENT

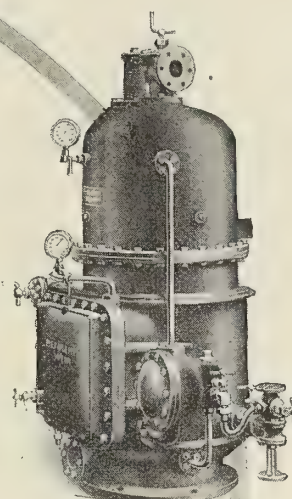
Reliability is the essential requirement in marine service.

Bethlehem-Built marine equipment is well known for its sturdy construction and lasting qualities and for its *reliability*—and in the long run, its *economy*.

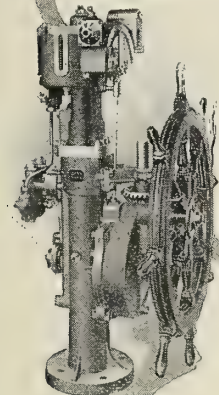
Catalogs on Request



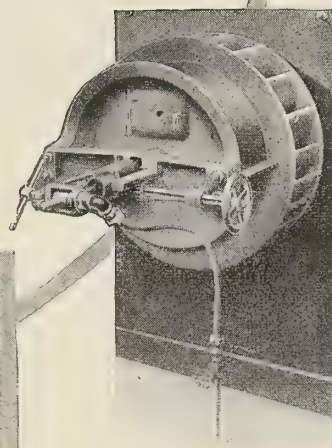
Pair of
Bethlehem-
Weir
Feed Pumps



Bethlehem-
Weir
Evaporator



Bethlehem
Hydraulic Telemotor



Bethlehem (Dahl)
Oil Burner and
Furnace Front

SEE OUR EXHIBIT AT THE
ANNUAL MARINE EXPOSITION
MARINE EQUIPMENT
ASSOCIATION OF AMERICA
CENTRAL MERCANTILE
BUILDING
45 W. 18th ST., NEW YORK CITY
WEEK OF NOVEMBER 14, 1921

BETHLEHEM SHIPBUILDING CORPORATION, Ltd.

General Offices: BETHLEHEM, PA.

Sales Offices:

New York
Boston

Philadelphia
Baltimore

Washington
Atlanta

Pittsburgh
Cleveland

Detroit
Chicago

St. Louis
San Francisco

Largest Repair Plant in



AEROPLANE VIEW OF PLANT

JAMES SHEWAN

Over 50 Years of C

Brooklyn Yard

Ft. of 25th, 26th, 27th and 28th Streets

Port of Greater New York

Dry Docks: There are 10 dry docks ranging from 500 to 12,000 tons. No. 7 is 450 ft. Long, 110 ft. Breadth, 35 ft. Draft over Keel Block and 12,000 ton capacity.

Floating Derricks: The Derrick boats are of 10, 15, 20, and 40 tons capacity.

Tugs and Launches: For moving and shifting vessels, there are four ocean-going tugs, and four steam launches to take workmen to vessels anchored in the stream.

Electric Welding Barges and Floating Air Compressors: Four twin unit electric welding barges. Two air compressor barges.

Special Equipped Barge: Barge equipped to furnish steam and apply water pressure to boilers.

Boiler Shop: 475 ft. x 75 ft. Equipped with electric hoists, compressors—oil burning plate heating furnace 35 ft. x 8 ft.—oil burning bar heating furnace 55 ft. x 5 ft.

Machine Shop: 296 ft. x 70 ft.—equipped with two electric cranes—capacity up to 50 tons.

Power Plant: 73 ft. x 70 ft.

Electric and Air Compressor Plant: 60 ft. x 70 ft.

Pipe Fitting Shop: 75 ft. x 150 ft.

Coppersmith, Tinsmith and Plumbing Shop: 250 ft. x 80 ft.

Blacksmith Shop: Contains thirty blacksmith fires and six large steam hammers, with all necessary appliances.

Saw Mill, Joiner, Carpenter and Pattern-maker Shop: 140 ft. x 69 ft.

Berthing Facilities: Forty Steamers with a mean draft of about 35 ft. can be easily berthed.

Fire Equipment: Automatically operated pressure pump maintains a constant pressure of 125 lbs. throughout the entire yard. The fire boat "Seth Low," formerly operated by the New York Fire Department, has been overhauled, is in first class fire fighting condition and is available at all times.

Railroad Siding: Railroad siding connecting with Bush Stores and the D. L. & W. R. R.

All the dry docks are motor driven; air compressors and all other machinery are electrically equipped. In this immense store yard is a vast amount of repair material including 5,000 tons of plates and angles.

JAMES SHEWAN & SONS, Inc., is in a position to handle any size conversion or repair job.

& SONS, Inc.

uous Operation

New York Office
32 Broadway

Largest Repair Plant in Port of Greater New York



AEROPLANE VIEW OF PLANT

JAMES SHEWAN & SONS, Inc.

Over 50 Years of Continuous Operation

Brooklyn Yard

Ft. of 25th, 26th, 27th and 28th Streets

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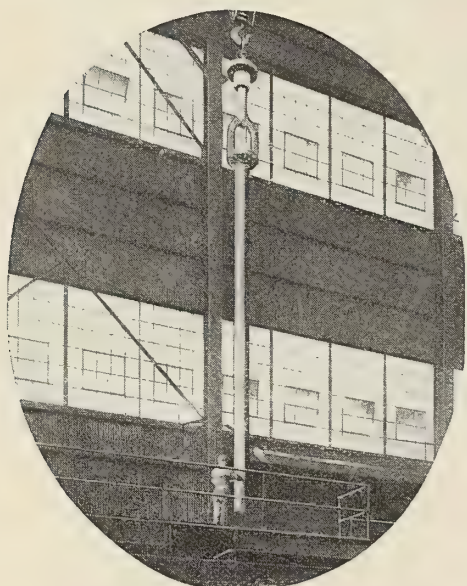
JAMES SHEWAN & SONS, Inc., is in a position to handle any size conversion or repair job.

New York Office

32 Broadway

POLLAK

MARINE

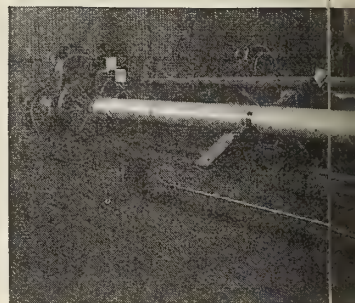


Heat Treating.

The danger of fatigue due to constant vibration and service is reduced to a minimum thru the use of POLLAK alloy steel, hollow bored, heat treated forgings.

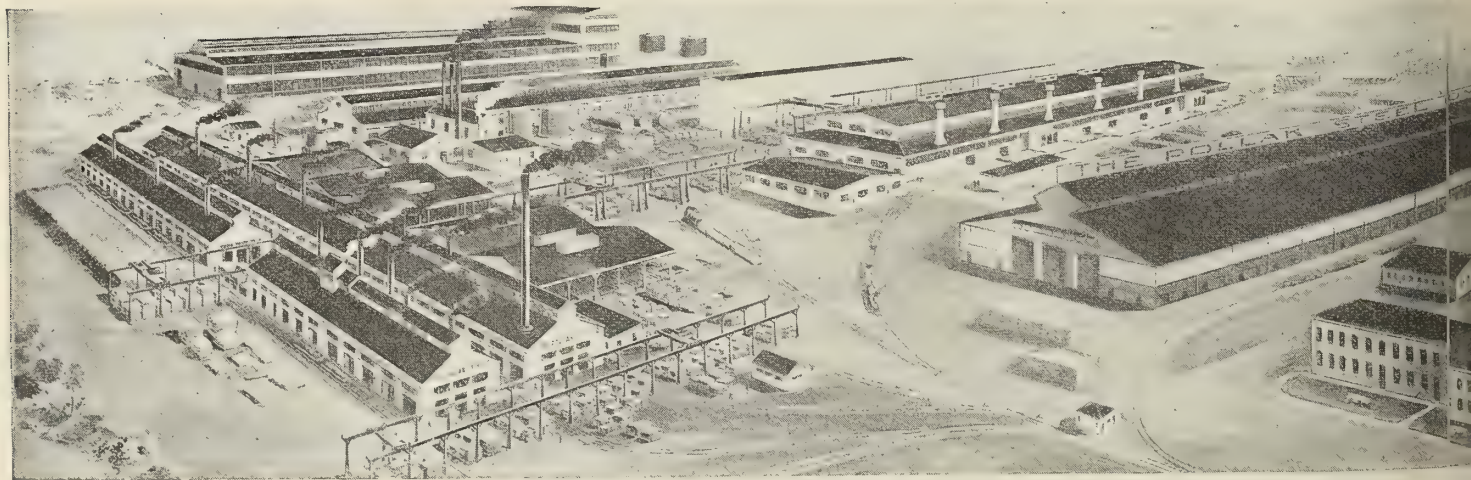
They represent the highest type of steel forgings obtainable to-day, and are the best assurance of maximum service and strength with a minimum of weight. Lighter for a given strength—stronger for a given weight.

**FORGED - - -
MACHINED - - -
HOLLOW BORED
HEAT TREATED
SHIPPED - - -**



THE POLLAK STEEL COMPANY

General Sales and Foreign Offices: Equitable Building, New York

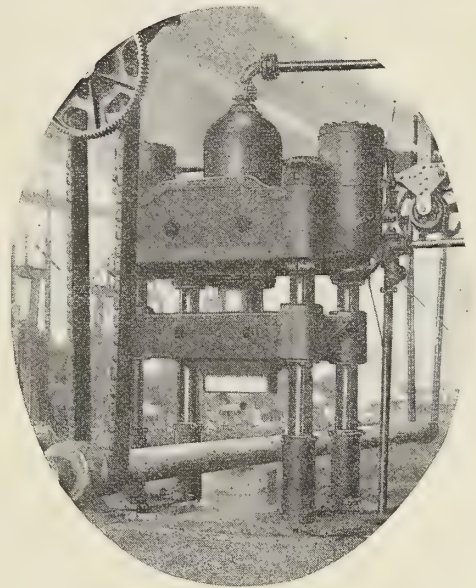


Aeroplane view of combined Pollak plants.

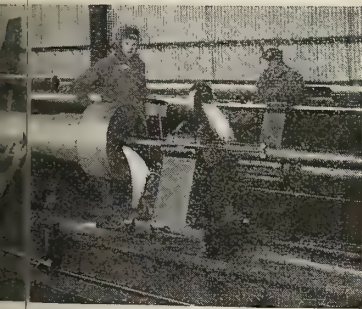
POLLAK FORGINGS

for **QUALITY**
for **ACCURACY**
for **SAFETY**
for **STRENGTH**
for **SERVICE**

Excellent producing facilities. Every forging a POLLAK forging from start to finish, reliably serving the purpose for which it was made. PROPELLER, THRUST, CAM, ROTOR, ENGINE and MOTOR SHAFTS, PISTON RODS, CONNECTING RODS, etc. Quality unquestioned, prices consistent, service assured. Prompt quotations on all inquiries.

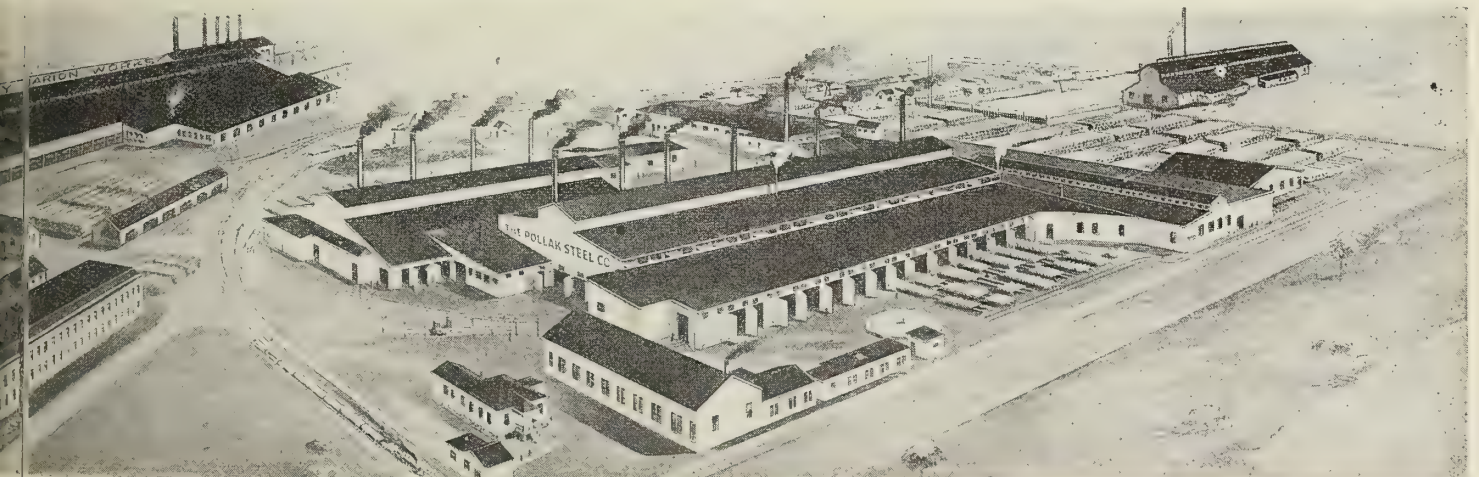


Forging.



General Offices Cincinnati, Ohio, U.S.A.

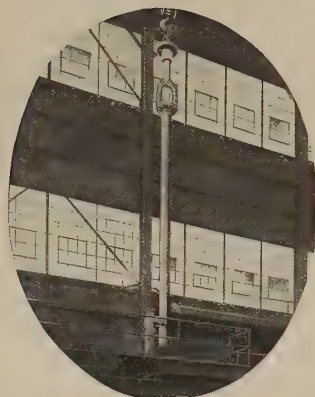
Works: Cincinnati, Marion, O., So. Chicago.



Cincinnati; Center, Marion, O.; Right, So. Chicago, Ill.

POLLAK

MARINE FORGINGS

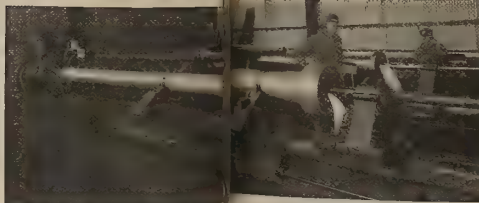


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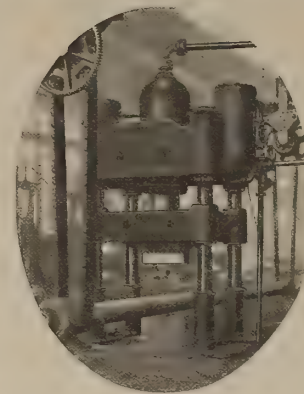
They represent the highest type of steel forgings obtainable today, and are the best assurance of maximum service and strength with a minimum of weight. Lighter for a given strength—stronger for a given weight.

FORGED . . . for QUALITY
MACHINED . . . for ACCURACY
HOLLOW BORED . . . for SAFETY
HEAT TREATED . . . for STRENGTH
SHIPPED . . . for SERVICE



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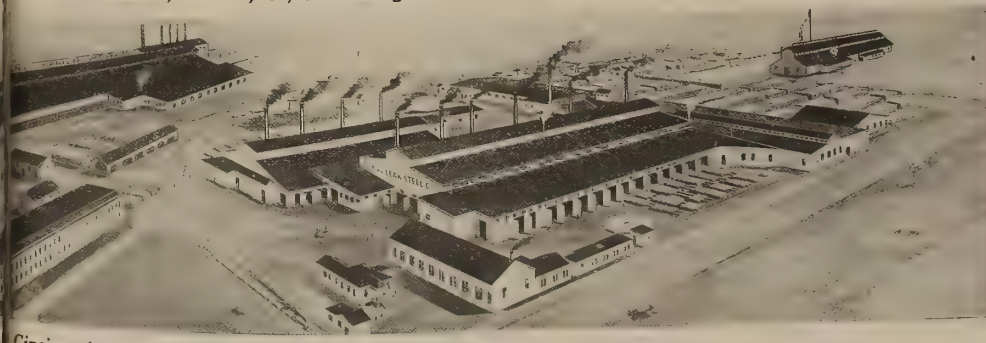
Forging.

THE POLLAK STEEL COMPANY

General Sales and Foreign Offices: Equitable Building, New York

General Offices Cincinnati, Ohio, U.S.A.

Works: Cincinnati, Marion, O., So. Chicago.



Aeroplane view of combined Pollak plants.

Cincinnati; Center, Marion, O.; Right, So. Chicago, Ill.



CRESCENT BRAND

Admiralty
Muntz Metal
70-30 Brass

Other Non-ferrous Alloys
Tinned or Plain
All Standard Sizes



Certified Pure Metals Only Are Used

The purest metals only are selected for making Wheeler Crescent Brand Tubes. The chief metals are copper, zinc and tin, which are compounded in various proportions according to the formula required. All metals are closely checked by chemical analysis and any shipment not conforming to our rigid specifications is rejected. This is one means of guaranteeing high grade and uniform tubes.

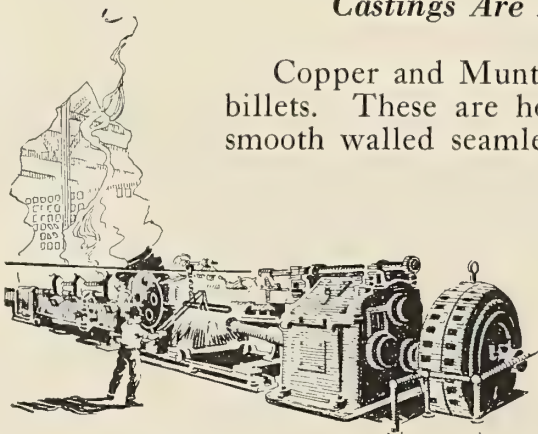
Metals Are Melted in Electric Furnaces

By melting the metals in electric furnaces, we reduce oxidation and volatilization to a minimum, and are thereby enabled to maintain high standard physical properties and adhere very closely to a specified formula.



Castings Are Hot Pierced or Extruded Before Drawing

Copper and Muntz metal (60% copper, 40% zinc) are cast in solid billets. These are hot pierced in a powerful piercing mill, forming smooth walled seamless tubes, which can be cold-drawn to dimensions.



Admiralty mixture (70% copper, 29% zinc, 1% tin) and Seventy-thirty brass (70% copper, 30% zinc) are cast as hollow cylindrical shells. The first operation in working these shells to tubes of required dimensions is an extrusion process after which, as well as between all succeeding operations, the metal is annealed.

TUBES OF QUALITY

Condenser Tubes
Evaporator Tubes
Heater Tubes

Voice and Railing Tubing
Brass and Copper Water
Steam and Oil Piping

CRESCENT
BRAND

Tubes Are Cold-Drawn to Size and Gauge

Wheeler Crescent Brand Tubes are cold-drawn to specified dimensions on powerful benches designed to draw the metal slowly and steadily through highly polished steel dies. On the inside of the tube is a polished steel plug on a rod which is so placed within the die as to prevent the tube from collapsing while it is being worked to the required dimensions.



All Annealing is Under Expert Supervision

After each cold-drawing operation, the metal is annealed in order to recrystallize it and remove distortion caused by the strain. This is no longer a hit-and-miss process, but is controlled both by indicating pyrometers and by recording instruments, thereby maintaining an accurate check on heat treatment of materials during the process of manufacture, as well as of the finished product.

Annealing is very exacting and requires constant supervision. At the Wheeler Tube Mill, annealing is done by men long associated in the wrought brass business.

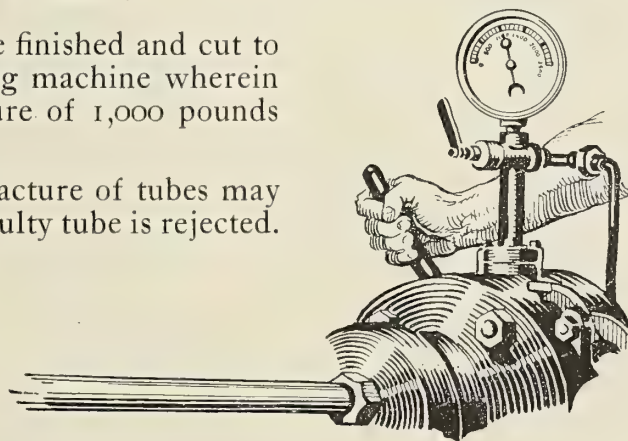


Finally Tested to 1,000-Pounds Pressure

After Wheeler Crescent Brand Tubes are finished and cut to required lengths, they are passed to a testing machine wherein each tube is subjected to a hydraulic pressure of 1,000 pounds per square inch.

Any defect developed during the manufacture of tubes may become apparent under this test, and every faulty tube is rejected.

This severe pressure test demonstrates the necessity of all the care which we exercise in selecting materials, in casting, in piercing, in drawing, and in the heat treatment of Wheeler Crescent Brand Tubes.



172

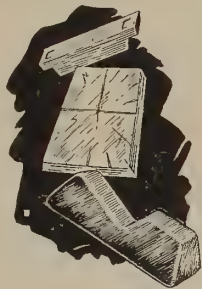
WHEELER CONDENSER & ENGINEERING COMPANY
CARTERET, NEW JERSEY

CRESCENT
BRAND

CRESCENT BRAND

Admiralty
Muntz Metal
70-30 BrassOther Non-ferrous Alloys
Tinned or Plain
All Standard Sizes*Certified Pure Metals Only Are Used*

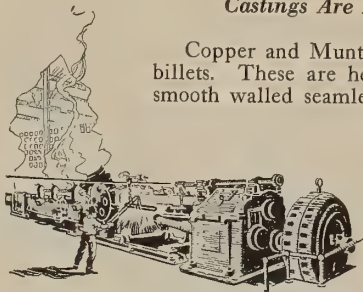
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BRANDCondenser Tubes
Evaporator Tubes
Heater TubesVoice and Railing Tubing
Brass and Copper Water
Steam and Oil Piping*Tubes Are Cold-Drawn to Size and Gauge*

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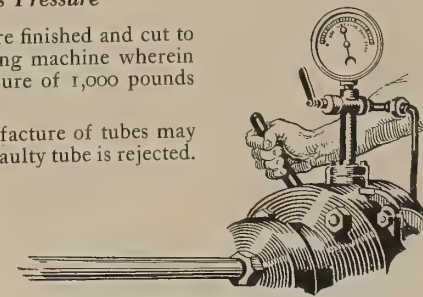
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FOR SATISFACTORY VENTILATION— PYLE-NATIONAL STEAM TURBINE DRIVEN FAN

"Must be satisfactory before they leave our factory"

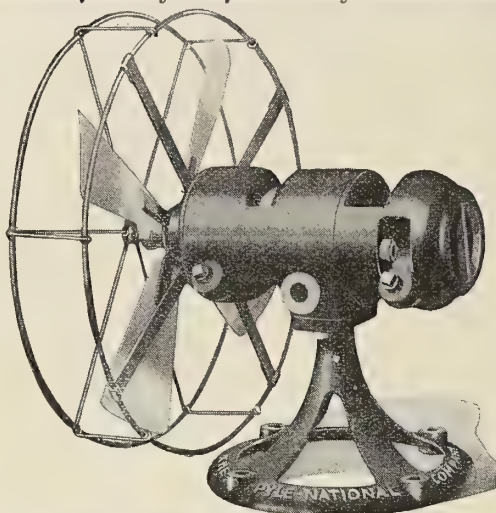
NO ADJUSTMENT REQUIRED
SAFE, CLEAN, SIMPLE.

BALL BEARING SELF-OILING

DIMENSIONS

14-inch Fan—15½ in. high, 15 in. wide,
12½ in. long

18-inch Fan—19 in. high, 19 in. wide,
12½ in. long



Steam Turbine Driven Ventilating and
Exhaust Fan

14 AND 18 INCH SIZES

100,000 and 200,000 cubic feet of air
delivered per hour

ELIMINATES ALL ELECTRICAL
TROUBLES

OPERATES ON STEAM PRESSURE
FROM 30 POUNDS UP AND AT LESS
COST FOR OPERATION THAN AN
ELECTRIC DRIVEN FAN

LIGHT!

FOR CANAL WORK—HARBOR WORK—DOCKING
A SHIP—FLOOD LIGHTING WATER, ETC.

COMBINATION SEARCH AND FLOOD-LIGHTS

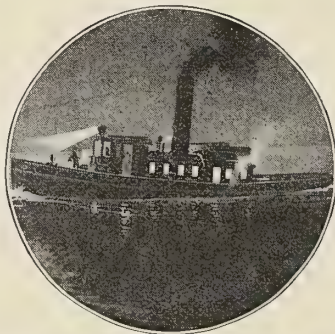
A Powerful Light for use on Pilot House, Bridge or Deck

They throw a flood-ray and spot-ray at the same time without changing focus. Lamps up to 1000 watts may be used with 12" size and up to 250 watts in 10" size.



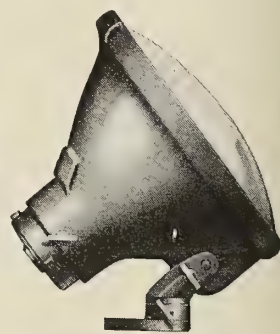
12" Search and Floodlight

The 12-inch light
may be had with
or without Pilot
House Control.



Lighting Harbor and River Boats

These are most
durable and effi-
cient lights for ma-
rine work and are
designed expressly
for such purpose.



10" Search and Floodlight

SEE OUR EXHIBIT AT BOOTH NO. 145

NEW YORK MARINE SHOW

THE PYLE-NATIONAL COMPANY

The Largest Manufacturers of Small Steam Turbines

New York Office
30 Church Street

General Office and Factory
1334 N. Kostner Avenue
CHICAGO, ILL., U. S. A.

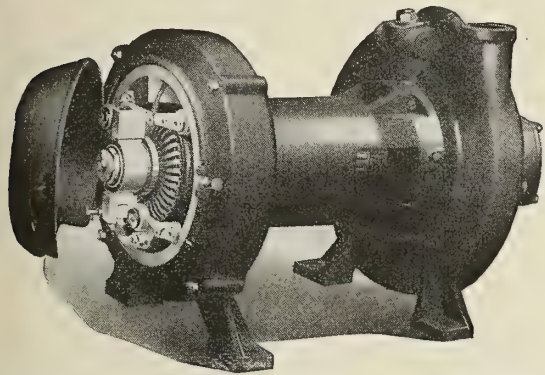
FOR LIGHTING ALL MARINE CRAFT —PYLE-NATIONAL TURBO-GENERATORS

"Results at night are slight, without the proper light"



Steamship Lighting—An improved idea in the multiple unit plan. Capacities up to 20 KW.

"E-S" TURBO-GENERATOR

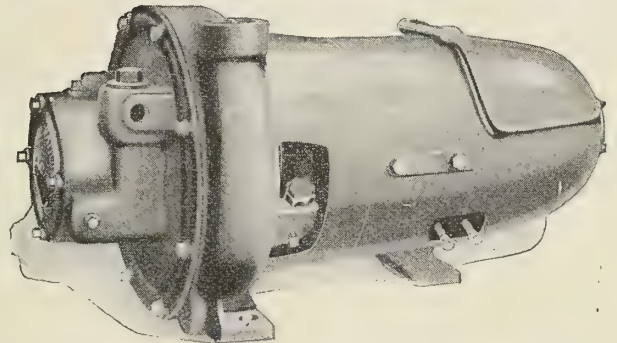


Capacity1500 watts
Voltage 110 volts
Height18½ in.

Width16½ in.
Length 30 in.
Net weight 275 lbs.

OVER
90,000
HAVE
BEEN
SOLD

"M" TURBO-GENERATOR



Capacity3 to 5 KW.
Voltage32 to 220 volts
Height19 in.
Width20¾ in.
Length39 in.
Net weight500 lbs.

These Turbo-Generators are Self Contained Units that do not require expensive foundations, switchboards, rheostats or other regulating devices, making the installation very simple and inexpensive.

They come to you ready to set up and operate continuously without trouble.

Capacity Ratings range from ½ to 5 KW. in Single Units.

A Double Unit Installation, connected in parallel, will give you not only double capacity (10 KW.) but also the desirable feature of a duplicate lighting plant, in emergency, and at a lower initial cost than any single unit of like capacity.

SEE OUR EXHIBIT AT BOOTH NO. 145

NEW YORK MARINE SHOW

THE PYLE-NATIONAL COMPANY

The Largest Manufacturers of Small Steam Turbines

New York Office
30 Church Street

General Office and Factory
1334 N. Kostner Avenue
CHICAGO, ILL., U. S. A.



USES FOR RUSTSOLVO ON
BOARD SHIP

Softening rust on—

Hatches
Winches
Windlasses
Steering Engines
Davits

**Cutting rust, paint,
grease or carbon
in repairing—**

Auxiliary Pumps
Generators
Blowers
Separators
Condensers
Feed Water Heaters
Filters
Ash Ejectors
Valves

**Cutting rust grease
or carbon in re-
pairing—**

Turbines
Reciprocating
Engines
Diesel Engines
Electric Motors

Cleaning—

Ladders
Stanchions
Screens
Hinges
Door Locks
Stoves

Keep the Rust Out of Your Deck Machinery

Each trip at sea adds its coating of rust to your deck machinery. Rust which must be removed before making port.

As long as ships have sailed, the labor of removing that rust has been accepted as necessary.

Now science has come to the aid of the navigator, and the use of Rustsolvo, the child of science, will eliminate the hours of labor once spent in removing rust. A few drops of this new liquid applied to rusted bolts, pins and gears softens the rust so that they can be turned by a child. An application before making port assures perfect operation.

For Rustsolvo is the liquid that cuts rust. In like manner, it will cut carbon, graphite, green corrosion on batteries and shellac without injury to metal, rubber, wood, cloth or the hands.

Order Rustsolvo now and try it on your deck machinery. Satisfaction guaranteed or money refunded.

If your ship chandler does not have Rustsolvo in stock, send your orders direct to us:

Size	Gallon	Half Gallon	Quart	Pint
Price	\$6.00	\$3.25	\$2.00	\$1.00

**The Rust Products Co.
of America**

64 EAST LAKE ST., CHICAGO, ILL.

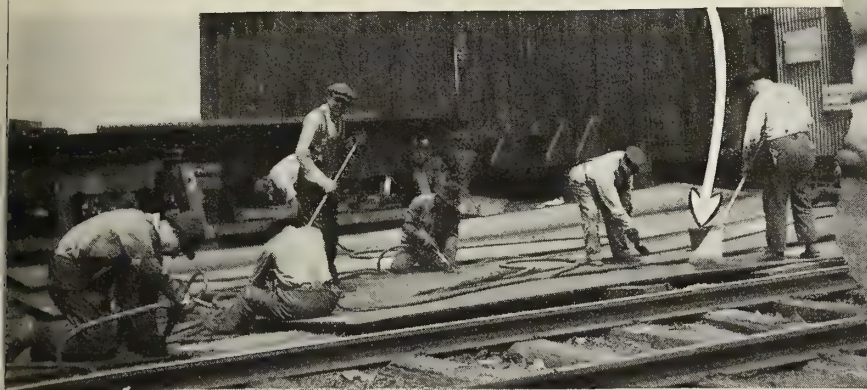
RUST

*The product that is
destined to save millions
of dollars yearly in con-
nection with metal re-
pair work in Shipbuild-
ing and Repair Yards*

R **RUSTSOLVO**

Cuts Rust

THE PRODUCT WITH OVER A THOUSAND USES



Reduce the Cost of Removing Rust

When your shell plates are punched far in advance of the erection schedule and lie in the plate racks, exposed to rain and snow, they rust. That rust must be removed in way of the side frames, butts and laps.

Chippers will clean the plates. But the cost per ton will be tremendous.

Paint those plates with Rustsolvo first. The work of the chipper will be reduced fifty per cent—and your cost will decrease proportionately.

Rustsolvo softens rust, red or white lead, paint, tar, grease or dirt. It is a harmless, free flowing, non-inflammable liquid. It works quickly and without injury to metal, rubber or wood.

Order Rustsolvo now and try it on those rusty plates and bolts. Satisfaction guaranteed or money refunded.

SOLVO

On Board Ship, Railroads, Automobiles, and Trucks, Farm Machinery, Plumbing, Construction Work, etc.

If your ship chandler does not have Rustsolvo in stock, send your orders direct to us.

Size	Gallon	Half Gallon	Quart	Pint
Price	\$6.00	\$3.25	\$2.00	\$1.00

**The Rust Products Co.
of America**

64 EAST LAKE ST., CHICAGO, ILL.

USES FOR RUSTSOLVO IN
SHIPBUILDING AND
REPAIR YARD

Softening rust or
paint and making
scaling with a chip-
ping hammer easy
on—

Shell Plates
Deck Plates
Frames
Beams
Bulkheads
Foundations
Fantails
Deck Houses

Loosening bolts in—
Stringer Bars
Bounding Bars
Clips
Liners
Assembled Work

Loosening bolts and
repairing machin-
ery in the—

Plate Shop
Machine Shop
Blacksmith Shop
Pipe Shop
Tool Room
Boiler Shop
Power House

Cleaning and Repair-
ing—

Reaming Machines
Chipping Hammers
Riveting Hammers
Drilling Machines



USES FOR RUSTSOLVO ON
BOARD SHIP

Softening rust on—

Hatches
Winches
Windlasses
Steering Engines
Davits

**Cutting rust, paint,
grease or carbon
in repainting—**

Auxiliary Pumps
Generators
Blowers
Separators
Condensers
Feed Water Heaters
Filters
Ash Ejectors
Valves

**Cutting rust grease
or carbon in re-
painting—**

Turbines
Reciprocating
Engines
Diesel Engines
Electric Motors

Cleaning—

Ladders
Stanchions
Screens
Hinges
Door Locks
Stoves

Loosens the Parts That Stick
RUSTSOLVO
THE PRODUCT WITH OVER A THOUSAND USES

Keep the Rust Out of Your Deck Machinery

Each trip at sea adds its coating of rust to your deck machinery. Rust which must be removed before making port.

As long as ships have sailed, the labor of removing that rust has been accepted as necessary.

Now science has come to the aid of the navigator, and the use of Rustsolvo, the child of science, will eliminate the hours of labor once spent in removing rust. A few drops of this new liquid applied to rusted bolts, pins and gears softens the rust so that they can be turned by a child. An application before making port assures perfect operation.

For Rustsolvo is the liquid that cuts rust. In like manner, it will cut carbon, graphite, green corrosion on batteries and shellac without injury to metal, rubber, wood, cloth or the hands.

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Price	\$6.00	\$3.25	\$2.00	\$1.00

**The Rust Products Co.
of America**

64 EAST LAKE ST., CHICAGO, ILL.

RUSTSOLVO
The product that is destined to save millions of dollars yearly in connection with metal repair work in Shipbuilding and Repair Yards.

Cuts Rust
RUSTSOLVO
THE PRODUCT WITH OVER A THOUSAND USES



USES FOR RUSTSOLVO IN
SHIPBUILDING AND
REPAIR YARD

Reduce the Cost of Removing Rust

When your shell plates are punched far in advance of the erection schedule and lie in the plate racks, exposed to rain and snow, they rust. That rust must be removed in way of the side frames, butts and laps.

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Price	\$6.00	\$3.25	\$2.00	\$1.00

**The Rust Products Co.
of America**

64 EAST LAKE ST., CHICAGO, ILL.

**Softening rust or
paint and making
scaling with a chip-
ping hammer easy
on—**

Shell Plates
Deck Plates
Frames
Beams
Bulkheads
Foundations
Fantails
Decks Houses

**Loosening bolts in—
Stringer Bars
Bounding Bars
Clips
Liners
Assembled Work**

**Loosening bolts and
repairing machin-
ery in the—**

Plate Shop
Machine Shop
Blacksmith Shop
Pipe Shop
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**Cleaning and Repair-
ing—**

Reaming Machines
Chipping Hammers
Riveting Hammers
Drilling Machines



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We can supply any valve or fitting for ship use

Also the entire system of fabricated piping, specials, bends, etc., in steel, brass, iron or copper as required.

CRANE CO.

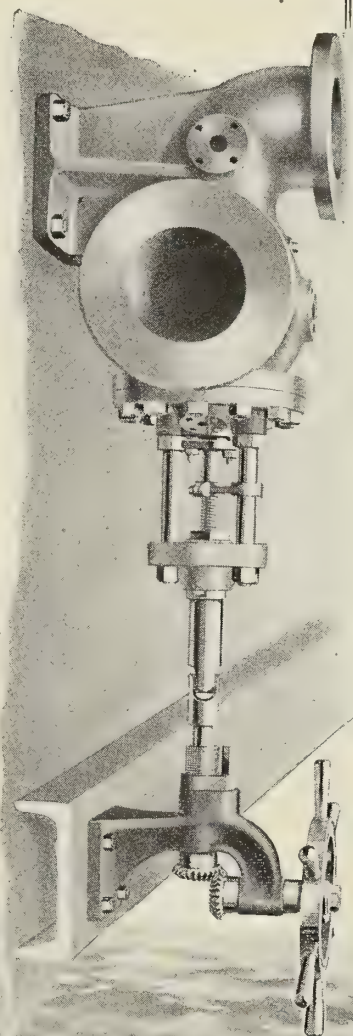
836 SO. MICHIGAN AVE.
CHICAGO

*See our exhibit at the
Annual Marine
Exposition*

*Marine Equipment As-
sociation of America,
Central Mercantile
Building, 45 West 18th
St., New York City,
week of November 14,
1921. Spaces 116 and
147.*

Branches in 65 leading cities

WORKS: CHICAGO AND BRIDGEPORT



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1921

FALK

HERRINGBONE GEARS

Consistent Service

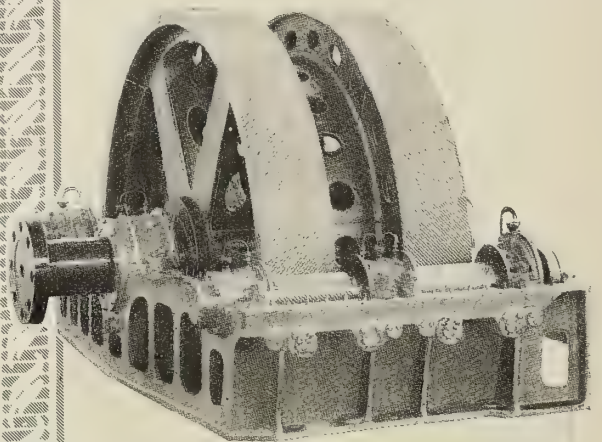
Falk Herringbone Marine Gear Units have never failed to live up to their reputation for absolute dependability even under the most unfavorable conditions.

This is a record which extends over many years—one which was earned not only in the merchant ship service, but under the most trying circumstances in the United States Navy.

The Principle involved in the Herringbone design—The materials used in the construction of Falk Marine Gear Units—and the unqualified guarantee which stands back of every Falk Gear are the factors which safeguard Marine Engineers in their selection of this correct power transmission equipment.



*6000 SHP Single Reduction
Falk Herringbone Marine
Gear Unit for Compound
Turbines
Speed 1900 to 132 RPM.*



*Interior Construction of
6000 SHP Falk Unit.
This type is designed for
Twin Screw Passenger
Ships.
Speed 1800 to 125 RPM.*

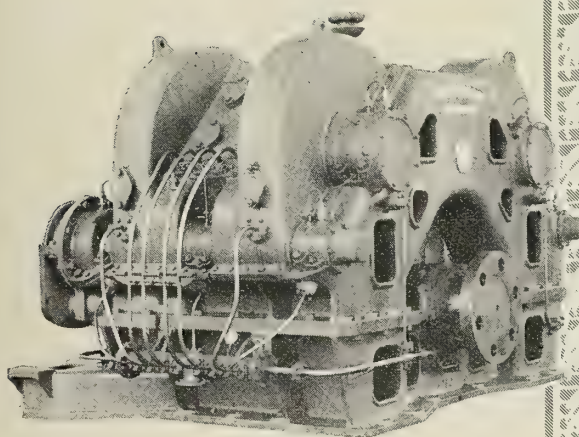


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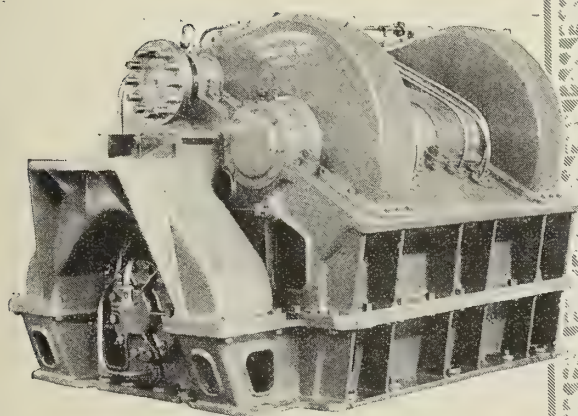
THE FALK
SUCCESSOR
THE FALK

FALK

HERRINGBONE GEARS



2800 SHP Falk Double
Reduction Gear Unit for
Compound Turbines.
Speed 3600 to 90 RPM.



1500 SHP Falk Double
Reduction Gear Unit for
Single Turbines.
Speed 3600 to 90 RPM.

Practical Assistance

The Falk Corporation organization includes an engineering department which, through many years of constant work on Marine Gear problems, is amply equipped to render real service on *your* power transmission problems.

This department is prepared to give prompt, expert and specific solutions to individual questions upon request.

If your present work involves the advisability of replacing old gearing with new, you can obtain practical assistance by communicating with our engineering department.

Do not hesitate to get in touch with our nearest representative.

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Engineering Equipment Co., Ltd., 263 St. James St.,
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Your Assurance of the Utmost in Rope Value

EVERY coil of Whitlock Manila now bears this orange and black label—the trade mark of superiority.

If you are a dealer whose trade demands quality rope at reasonable price, or if you are a rope user and wish to save money, write today for the new Whitlock Catalog. And ask for the Whitlock distributor in your territory.

WHITLOCK CORDAGE
THE UTMOST IN ROPE VALUE

Whitlock Manila is the rope that is guaranteed superior to U. S. Government Specifications not only in strength, tare and length per pound, but also in quality of fibre.

WHITLOCK CORDAGE COMPANY

46 South Street, New York

Factory and Warehouses: Jersey City, N. J.

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MAHRVEL INDUSTRIAL FURNACES AND BLOWERS

MAHRVEL TORCHES SELF CONTAINED OR COMPRESSED AIR TYPE

Mahrvel Oil Burning Rivet Forges

Give 100% results in quality and quantity of rivets prepared for the hammer.

Waste in fuel and from poorly heated rivets reduced to a minimum.

MAHRVEL standard Rivet Forges,—No. 12-D for ship-building and all scaffolding work, No. 16 stationary and No. 15 portable on small wheels for shop work, and No. 18 portable on larger wheels for yard repair work—all four, carry their own oil tank.

These forges are supplied with vacuum type of Burner, thereby eliminating pressure on oil tank and resultant disadvantages.

One Railroad is using several hundred of these forges and buying more.

Two larger standard sizes (No. 35 and No. 37) are made for work requiring large rivets or small ones in great quantity.

MAHRVEL Rivet Forges stand at the head in supplying rivets uniformly heated, without scale, in quantity desired.

Practicing "truth in advertising" we invite trial orders for MAHRVEL standard Rivet Forges.

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Solicited*

Best results in all rivet jobs are important to plant owners and operators.

MAHRVEL Rivet Forges will increase pleasure and profit to both employer and employee.

Please write or inquire of Field Representative now.

MAHR MANUFACTURING COMPANY

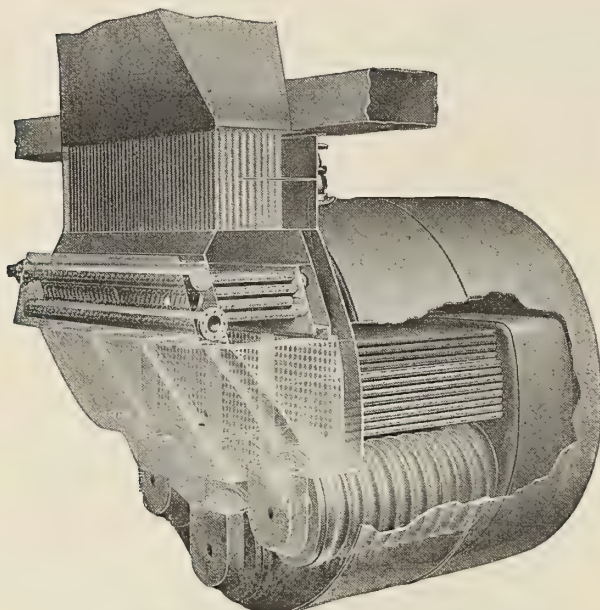
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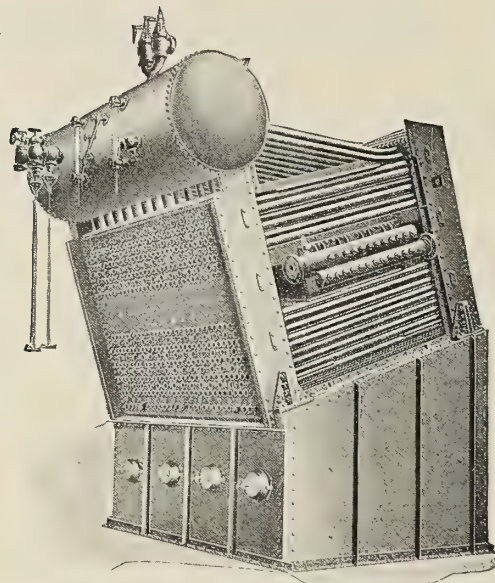
MAHRVEL CALORIZOR, BURNING OIL OR GAS

MAHRVEL CORE OVENS AND LADLE HEATERS

The extent of superheat in marine use



Foster Marine Superheater installed in uptake
of Scotch Marine Boiler



Foster Marine Superheater installed in tube-
bank in Foster Marine Water-tube Boiler

Superheat is rapidly becoming standard practice in the merchant marine as it enables the steam prime mover to increase its efficiency at the minimum expense in first cost and upkeep cost.

Over fifty percent of all American steamships in foreign trade are fitted with superheaters. The major portion of these develop a superheat of 50 to 75° F.

This amount of superheat can be used in triple expansion engines without oil for lubrication of cylinder walls. A moderate amount of superheat is also sufficient to overcome the priming that occurs with all types of boilers when heavily salted.

Foster Marine Superheaters are used in over seventy-five percent of the American ships equipped with superheaters. They are of the well known Foster Extended Surface type similar to the recognized standard in land plants. Their rugged construction is especially suitable for marine use where conditions are much more severe than in locomotive or stationary work.

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Works: Danville, N. Y., and Egham, England

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AGENCIES:

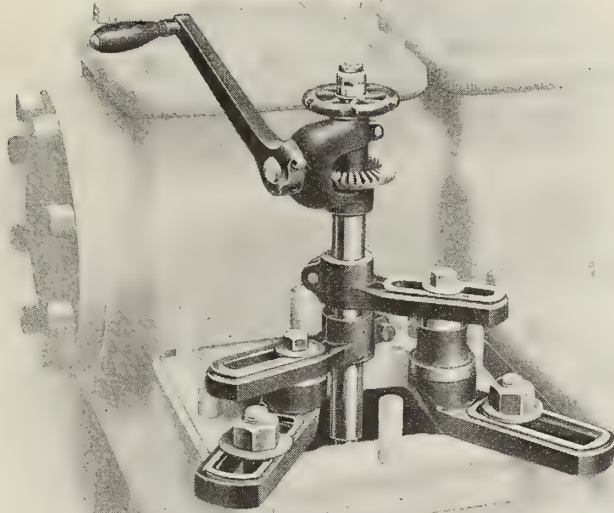
Norfolk, T. J. Egan Co.

New Orleans, Marine Supply Co.

Galveston, Neptune Ship Chandlery Co.

FOSTER SUPERHEATERS

One Hundred Per Cent Efficient



Think what it means to have your pumps operating on this basis.

The Dexter

Pump Valve Reseating Outfit refaces the seats.
It stops the slippage.

It does the work quickly.

It is easy to operate.

It does a finished job.

The investment is small.

The results are absolutely satisfactory.

Write today for Catalog M-23.

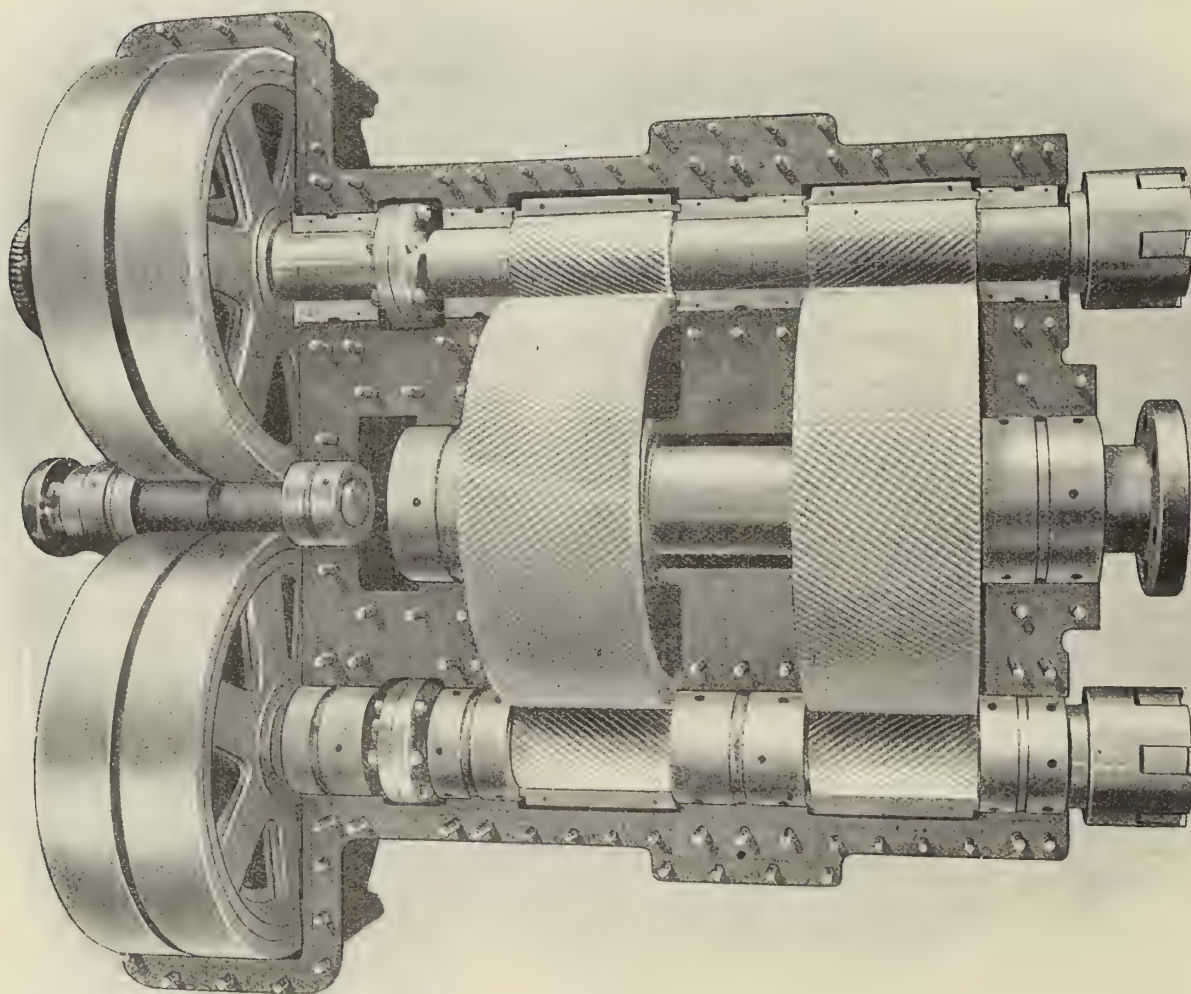
The Leavitt Machine Company

ORANGE, MASS., U. S. A.

Manufacturers of Dexter Globe, Gate and Pump Valve Reseating Machines

KERR

MARINE REDUCTION GEARS
100% ACTUAL PERFORMANCE
QUIET—RELIABLE—EFFICIENT



Plan View (cover removed) 2500 to 3000 S.H.P. Type

Manufacturers of Geared Turbine Propelling Machinery in capacities up to 6000 S.H.P.
Also Turbine Driven Auxiliaries, all sizes.

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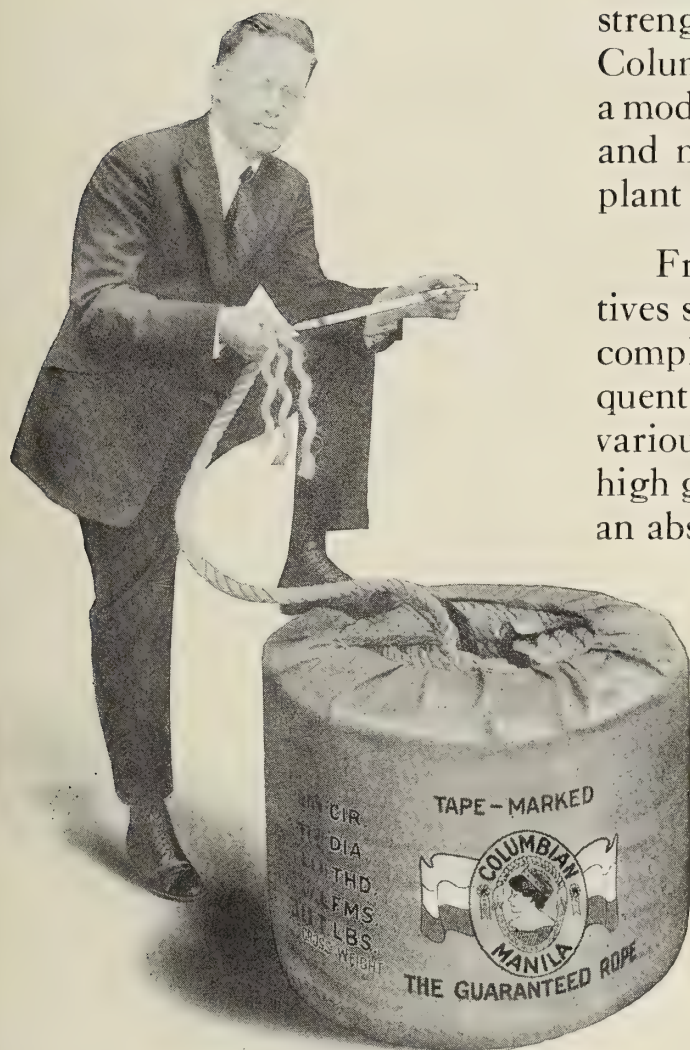
COLUMBIAN *Tape-Marked*

This Red, White and Blue *Tape-Marker*

—positively identifies and guarantees the strength, durability and service of every foot of Columbian Tape-Marked Pure Manila Rope—a modern product, made with modern machinery and methods in the most up to date Cordage plant in the country.

From the time that Columbian representatives select the fibre in the Philippines until the completed rope is coiled and ready to ship, frequent and rigid inspections are made during the various stages of manufacture. The result is a high grade rope that we are glad to back up with an absolute guarantee.

Buy Columbian Red, White and Blue Tape-Marked Rope.



Columbian Rope Company

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Branches
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Pure— Manila ROPE

Keep our Ships on the Seven Seas under the Stars and Stripes



Key number beside ship's name indicates operator shown bottom of column.

EUROPE

Plymouth, Boulogne and London

From New York

November 15—December 15—Centennial State (159).

November 26—December 27—Panhandle State (159).

Bremen and Danzig

From New York

December 31—Potomac (159).

December 3—Hudson (159).

December 10—Princess Matoika (159).

Plymouth, Cherbourg and Bremen

From New York

November 29—January 3—America (159).

December 8—January 17—George Washington (159).

SOUTH AMERICA

Rio de Janeiro, Montevideo and

Buenos Aires

From New York

November 10—American Legion (91).

November 24—Southern Cross (91).

December 8—Aeolus (91).

80 Matson Navigation Co.

120 Market St.,

San Francisco, Cal.

26 South Gay St., Baltimore, Md.

91 Munson Steamship Line.

67 Wall St., New York.

Tel. Bowling Green 3300.

105 Pacific Mail S. S. Co.

10 Hanover Sq., New York.

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621 Market St., San Francisco, Cal.

106 The Admiral Line.

17 State St., New York.

Tel. Bowling Green 5625.

L. C. Smith Bldg., Seattle, Wash.

158 United States Lines.

45 Broadway, New York.

Tel. Whitehall 2050.

FAR EAST

Honolulu, Yokohama, Kobe, Shanghai,

Manila, Hongkong

From San Francisco

November 12—Golden State (105).

December 17—Hoosier State (105).

January 14—Golden State (105).

February 7—Empire State (105).

March 4—Hoosier State (105).

March 25—Golden State (105).

April 19—Empire State (105).

May 13—Hoosier State (105).

Yokohama, Kobe, Shanghai, Hong-

kong, Manila

From Seattle

November 5—Keystone State (106).

November 26—Silver State (106).

HAWAII, PHILIPPINES, EAST INDIA

Honolulu, Manila, Saigon, Singapore,

Colombo, Calcutta

From San Francisco

November 15—Granite State (105).

December 14—Creole State (105).

COASTWISE AND HAWAII

Havana, Canal, Los Angeles, San

Francisco and Hawaiian Islands

December 3—Hawkeye State (80).

December 17—Buckeye State (80).

U. S. SHIPPING BOARD
Washington, D. C.



FOR SAILINGS OF FREIGHT SHIPS TO ALL PARTS OF THE WORLD WRITE DIVISION OF OPERATIONS, TRAFFIC DEPARTMENT, U. S. SHIPPING BOARD EMERGENCY FLEET CORPORATION, WASHINGTON, D. C.

A Safety Service Without Cost



A Safety Service Without Cost—

New Source of Revenue to Vessel Owners
Without a Penny of Investment or a
Minute of Time or Attention.

THE UNSINKABLE SAFE can be installed on any new or old vessel in 48 hours without a minute of loss in scheduled time and so situated as to take up **NO VALUABLE SPACE** NEEDED FOR OTHER PURPOSES.

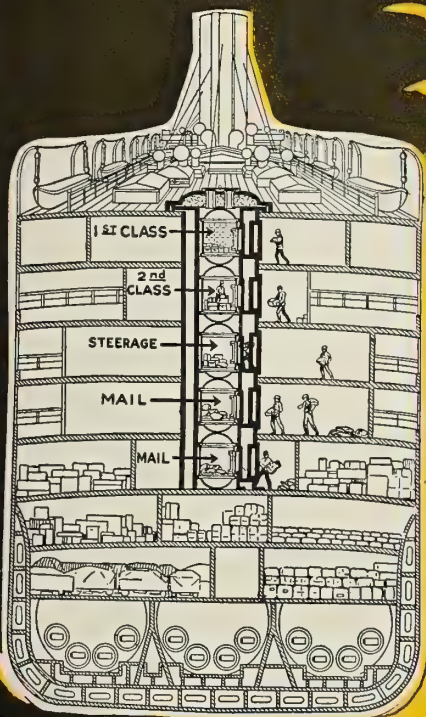
It offers positive protection against losses of any and all valuables through shipwreck, fire, collision and any possible catastrophe. Made of steel; both burglar and fireproof; highly endorsed by underwriters and authorities.

The unusual mail service, treasure protection and remarkable safety deposit features **PRODUCE A CERTAIN AND CONTINUOUS SUBSTANTIAL INCOME TO VESSEL OWNERS**. Suitable for both passenger and freight carriers.

Learn about our wonderful offer—complete service without cost. Write today for this information and copy of illustrated catalog "ME". Address all communications to main office.

OCEAN FLOATING SAFE COMPANY

4520 West Grand Avenue
CHICAGO, ILL.



*Sectional View of
Steamship Showing 5
Unsinkable Safes
Installed*



**You Can
Trust**

PLYMOUTH ROPE

made by

PLYMOUTH CORDAGE COMPANY
NORTH PLYMOUTH, MASS.

Our New Ten Thousand Ton Floating Dry Dock Now Ready for Business!



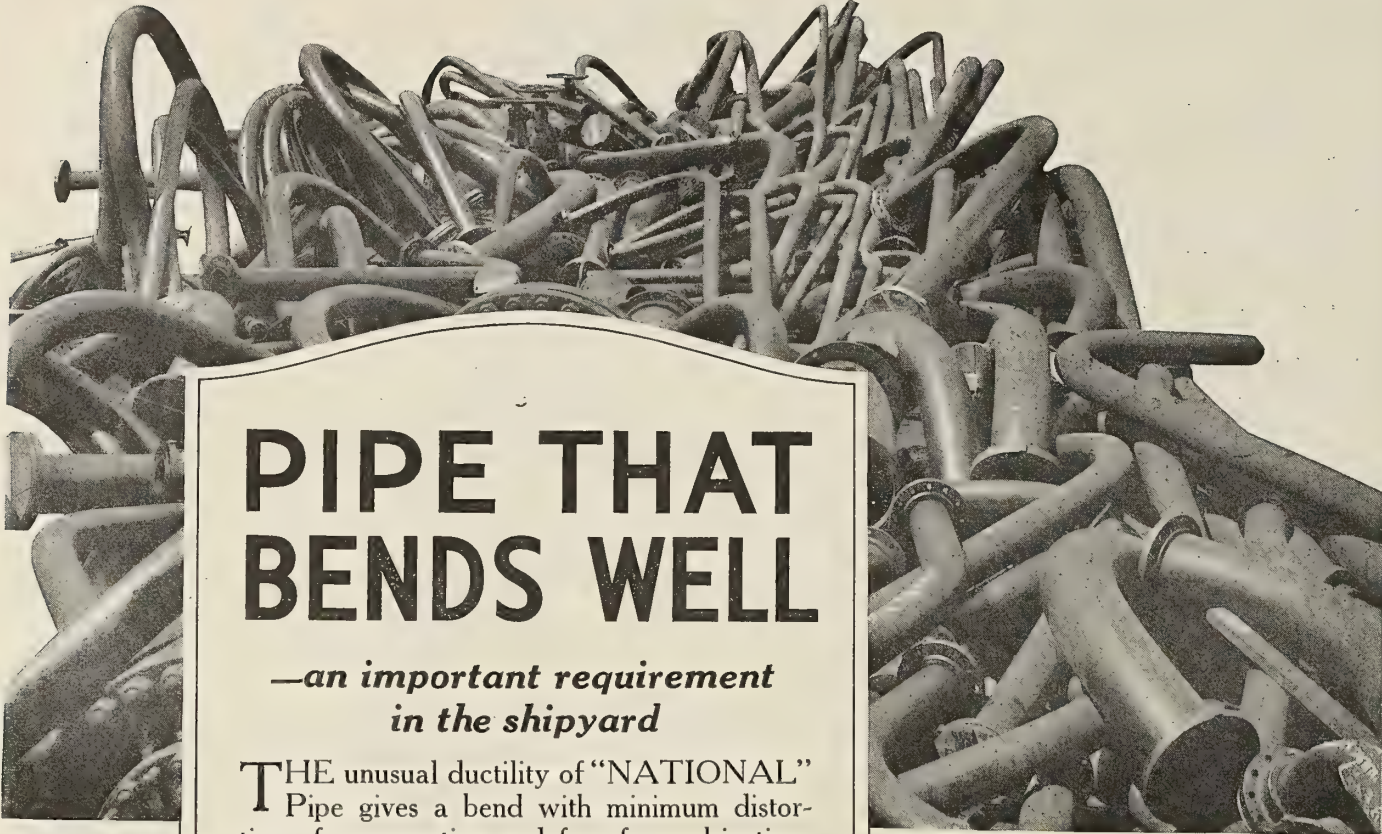
CAPACITY OF SHIPYARD—EIGHT BUILDING WAYS, THREE LARGE WET DOCKS
ENGINE BUILDERS—BOILER MAKERS—IRON FOUNDERS
EXTENSIVE FACILITIES FOR SHIP, ENGINE AND BOILER REPAIRS.

BUILDERS OF HIGH CLASS SINGLE AND TWIN SCREW PASSENGER AND CARGO
VESSELS, ALSO BULK OIL TANKERS, UP TO 600 FEET IN LENGTH

SUN SHIPBUILDING COMPANY

Main Office and Shipyard

Chester, Penna., U. S. A.



PIPE THAT BENDS WELL

*—an important requirement
in the shipyard*

THE unusual ductility of "NATIONAL" Pipe gives a bend with minimum distortion of cross-section and free from objectionable buckling.

The high tensile strength and sound welds maintain the required bursting strength of the pipe after it has been subjected to the severe stretching and compressive stresses of bending and flanging, while the elasticity remains amply high for absorbing the service stresses for which the bend may be designed.

Because of these factors, "NATIONAL" Pipe for bending and flanging purposes is exceptionally able to meet the requirements of the shipbuilding engineer.

Ask for a copy of
"National" Bulletin No. 9—"NATIONAL"
PIPE FOR SHIPBUILDING PURPOSES

LOOK FOR



THE NAME

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

General Sales Offices: Frick Building

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EXPORT REPRESENTATIVES: U. S. Steel Products Company											
				San Francisco		Los Angeles		Portland		Seattle	
				New York City							

Inside Facts about "Little David" Close Quarter Air Drills

Feed Screw— $3\frac{1}{4}$ -inch feed. Telescoping type. Thrust ball bearing carries feed pressure.

Two Piece Case—working parts easily accessible for inspection by taking out few cap screws.

Three Pistons—which apply power direct to rocking levers. No intermediate gears or complex mechanism.

Throttle Handle—rolling type. Easy to operate and no air leaks.

No. 9 "Little David"
Close Quarter Drill.

Spindle—special steel and heat treatment. Very strong—made in one piece.

Rocking Levers (3)—transmit power directly to spindle. One ratchet pawl is always engaged with a tooth of spindle giving very steady spindle movement.

Crank—three throw-drop forged. Spaces levers and drives the valve. Does not transmit any power to spindle.

50% More Power 50% Less Parts

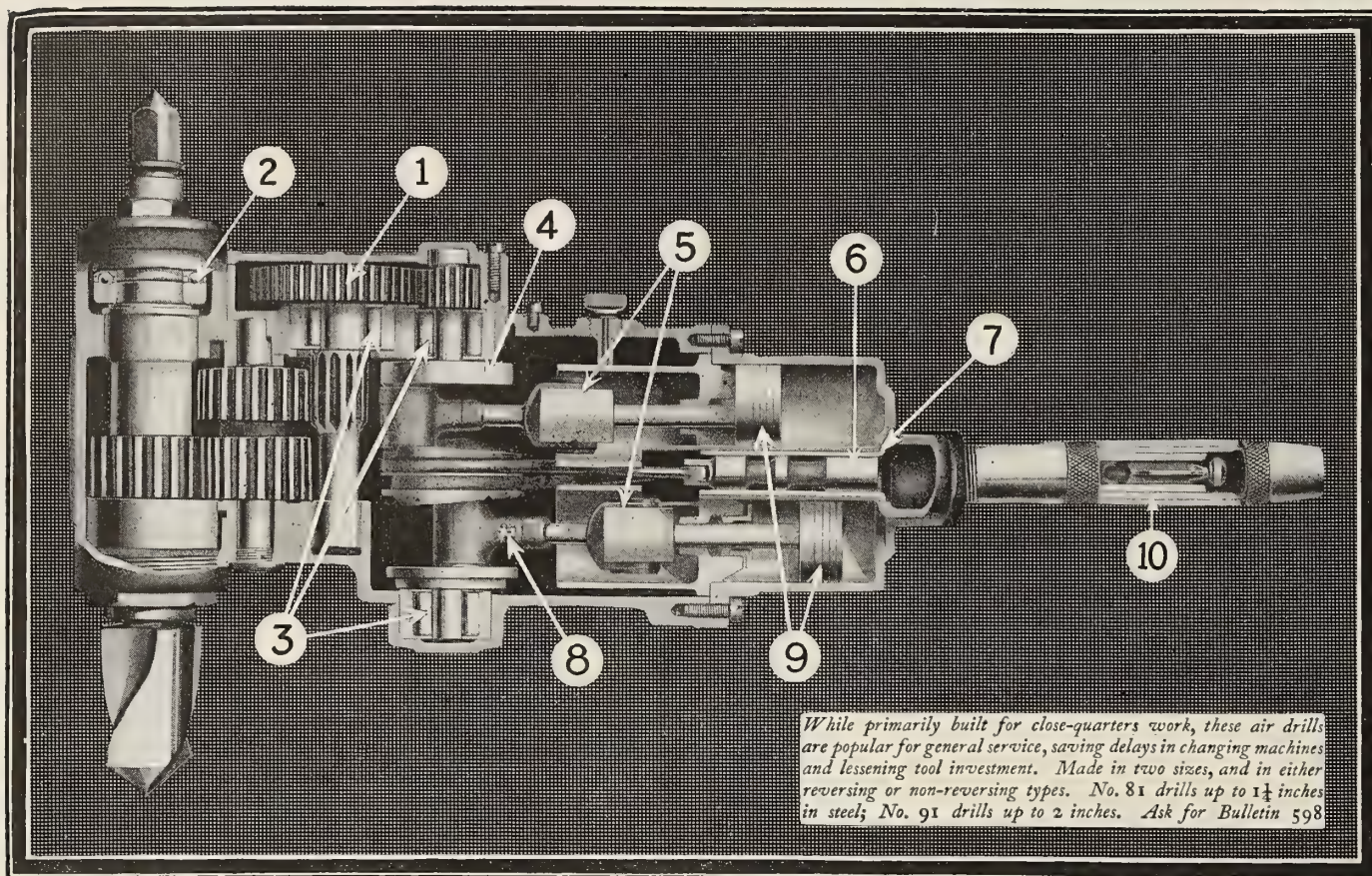
Catalog 8000
describes
"Little David"
Air Tools

Ingersoll-Rand Company
General Offices
11 Broadway, New York



Ingersoll-Rand

Air Drills, Chipping and Riveting Hammers, Air Motor Hoists.



A Little Giant that is preferred in and out of close-quarters —and 10 under-the-housings reasons why!

Little Giant Close Quarters Air Drill sectioned showing:

1 Train of sturdy stub-tooth gears. Made of special alloy steel. Transmits uninterrupted power to the drill spindle. No lost motion due to over-travel or slippage. 33% faster than drives of the ratchet type.

2 Thrust ball bearing carries feed screw pressure. Note spindle gear forged integral with spindle.

3 Roller bearings support gear train. Ample provision for thorough lubrication of working parts by means of "splash" system.

4 One-piece, solid forged steel crankshaft, having two throws with pins at 90 degrees. Crankshaft is of ample proportions and strength throughout.

5 Crossheads prevent side wear of cylinder walls and pistons. This construction parallels high-grade steam engine practice, insuring permanent alignment and long life of reciprocating parts.

6 Balanced piston valves fitted so that only room for the oil film is allowed. Provides a near perfect seal and requires the minimum of power to operate. Result—long life of parts and highest economy.

7 The valve pistons operate in replaceable, long-wearing bronze bushings, insuring long service and low upkeep cost.

8 The sturdy forged steel toggles and connecting rods are capable of withstanding the severest service.

9 The pistons are machined from solid stock, heat treated and ground to size, resulting in longest wear.

10 Standard Little Giant throttle control permits ease of operation with consequent increased production. Little Giant is the only close-quarters air drill which can be reversed from the throttle.

Chicago Pneumatic Tool Company

Chicago Pneumatic Building • 6 East 44th Street • New York

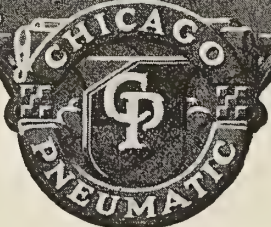
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P-101

BOYER PNEUMATIC HAMMERS · LITTLE GIANT PNEUMATIC AND ELECTRIC TOOLS
CHICAGO PNEUMATIC AIR COMPRESSORS · VACUUM PUMPS · PNEUMATIC HOISTS
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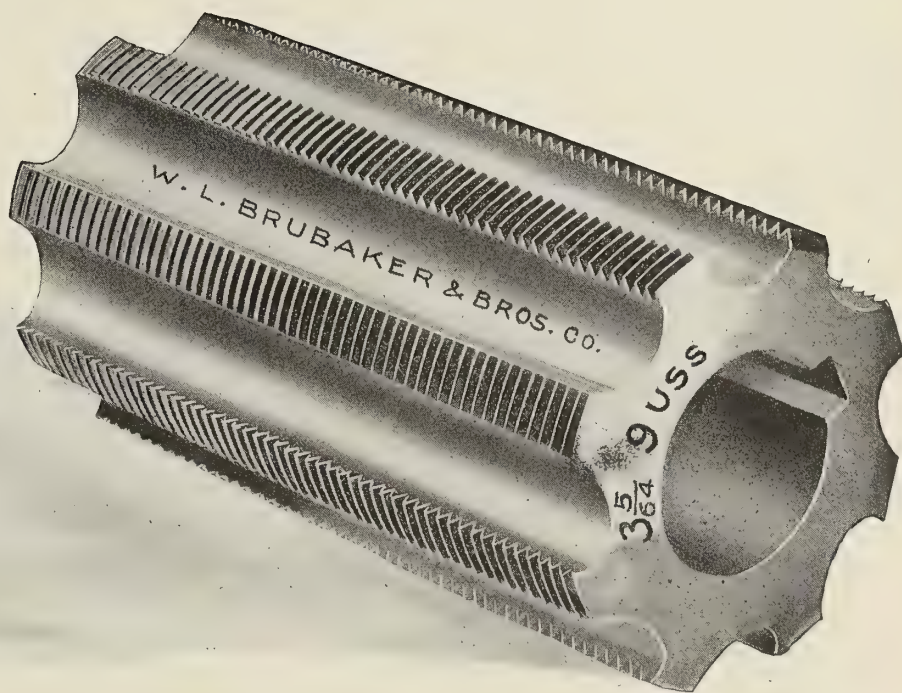
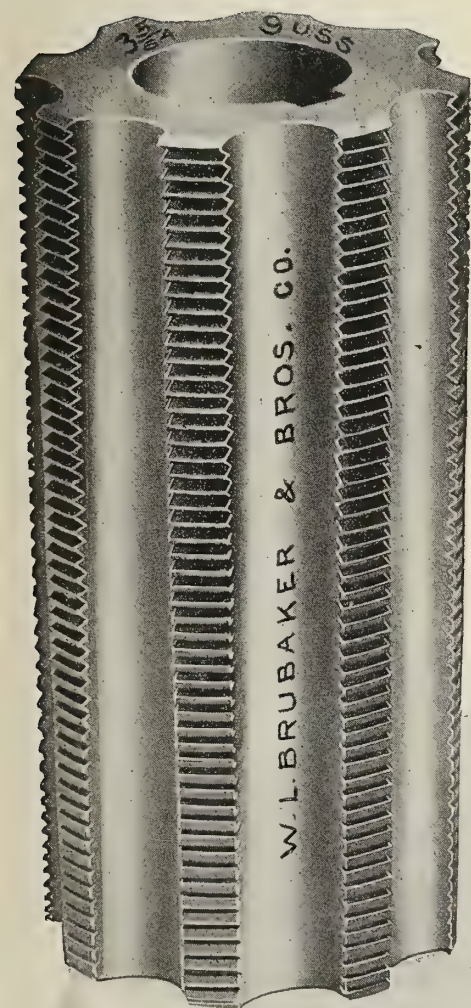
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Common Sense Screw Plates

Factory at
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STAY-TUBE TAPS

ALL SIZES — ANY LENGTH
FURNISHED IN TEN DAYS



Special Temper—Well Relieved—Easy Cutting—Best Grade Tool Steel.
Manufactured by Us Many Years—Carbon or High Speed Steel as Desired.

W. L. BRUBAKER & BROS. CO.



Where labor costs but a few cents a day

IN far-off Tientsin, China, with coolie labor plentiful at 2 or 3 cents a day, one of the big merchants finds it profitable to expedite the handling of goods with a Yale B-17 Electric Industrial Truck.

Even where labor is cheapest, the Yale Way proves cheaper.

Think how much greater your opportunity to profit by the Yale Way; with labor getting \$3.50 a day and upward.

Analyze your costs. See if

you don't find a surprisingly large percentage of all effort going into the handling and transferring of materials.

Yale Electric Industrial Trucks, or Yale Tractors and Trailers, provide exceptionally efficient means for yard and inter-plant transportation.

Other Yale Way units include Spur-Geared, Screw-Geared, and Differential Chain Blocks, Electric Hoists, and Trolley Systems.

What the Yale Way does for the Chinese merchant, it will do for you a hundred-fold.

Yale Made is Yale Marked

The Yale & Towne Mfg. Co.

*Makers of Yale Products: Locks, Hoists
and Electric Industrial Trucks*

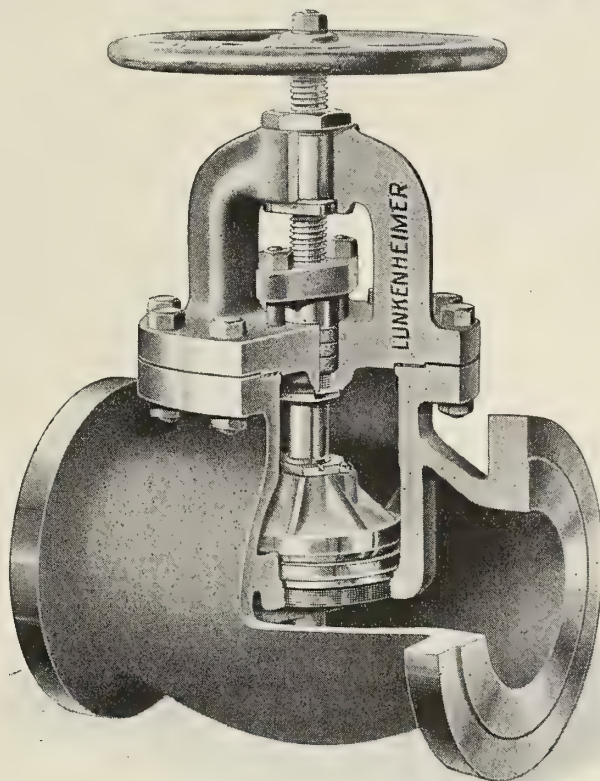
Stamford, Conn., U. S. A.



Hoisting and Conveying Systems

LUNKENHEIMER

Globe, Angle, Cross and Check Valves



Service economy,—long life with a minimum cost for upkeep, is the dominant factor which has led to the selection of LUNKENHEIMER Iron Body Valves as "standard equipment" on many merchant fleets.

Their success in service is the direct result of the combination of correct design with proper materials and the LUNKENHEIMER method of manufacture.

LUNKENHEIMER "Valve-iron" and LUNKENHEIMER "Valve-bronze" are formulated especially for valve service and the LUNKENHEIMER method of manufacture insures dependable results under prescribed operating conditions.

The line embraces a variety of patterns which experience has demonstrated are most efficient for marine service and whose performance and durability fully measure up to the LUNKENHEIMER high quality standard.

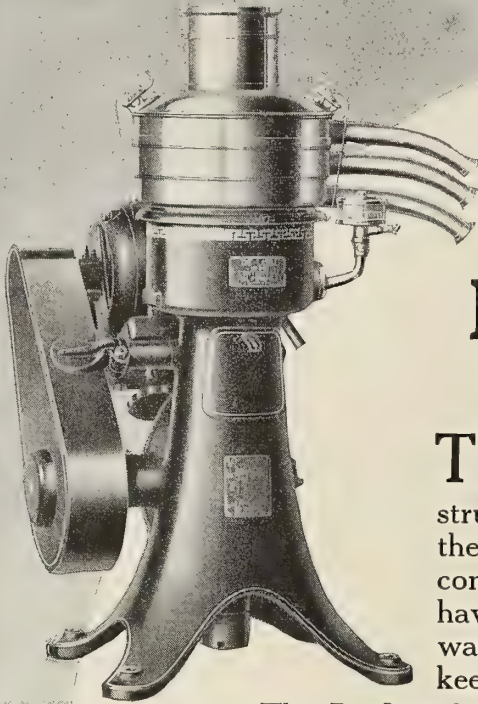
There is a LUNKENHEIMER Distributor in practically every port ready to give prompt service. Specify LUNKENHEIMER Iron Body Valves and insist on getting what you specify.

THE LUNKENHEIMER CO.
—"QUALITY"—

LARGEST MANUFACTURERS OF
HIGH GRADE ENGINEERING SPECIALTIES
IN THE WORLD

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Pride of France Saves Oil with a **DE LAVAL** Oil Purifier

THE S. S. Paris, of the French line, is the largest and most luxurious vessel ever constructed in France. Her builders have gone the limit to make her the last word in design, construction and operation. Naturally they have a De Laval Oil Purifier aboard to remove water and dirt from her lubricating oil and keep her turbine bearings in perfect condition.

The De Laval Oil Purifier on the Paris does two things: First, it gives her machinery longer life and lessens bearing troubles by keeping clean oil in the system at all times. Second, it obviates the necessity for ever pumping oil overboard and so materially reduces the cost of lubrication. Just this last feature of De Laval performance will pay for installing a machine within a short time. The De Laval Oil Purifier is simple in operation and positive in action. Strong centrifugal force removes impurities from the oil in heavy seas, as well as when the ship is in port.

De Laval Bulletins Nos. 102 and 103 give further interesting information. They are yours for the asking.

The De Laval Separator Company

Largest Manufacturers of Centrifugal Machinery in the World

New York, 165 Broadway

Chicago, 29 East Madison St.

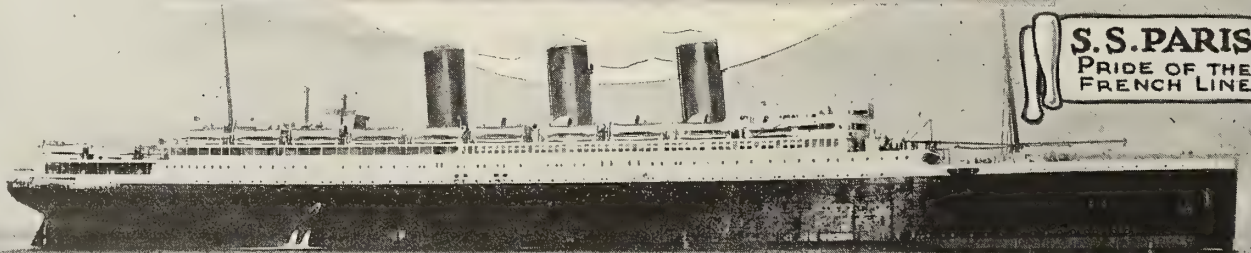
Manufacturers' Selling Agents

De Laval Steam Turbine Company
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De Laval Pacific Company
San Francisco, Cal.

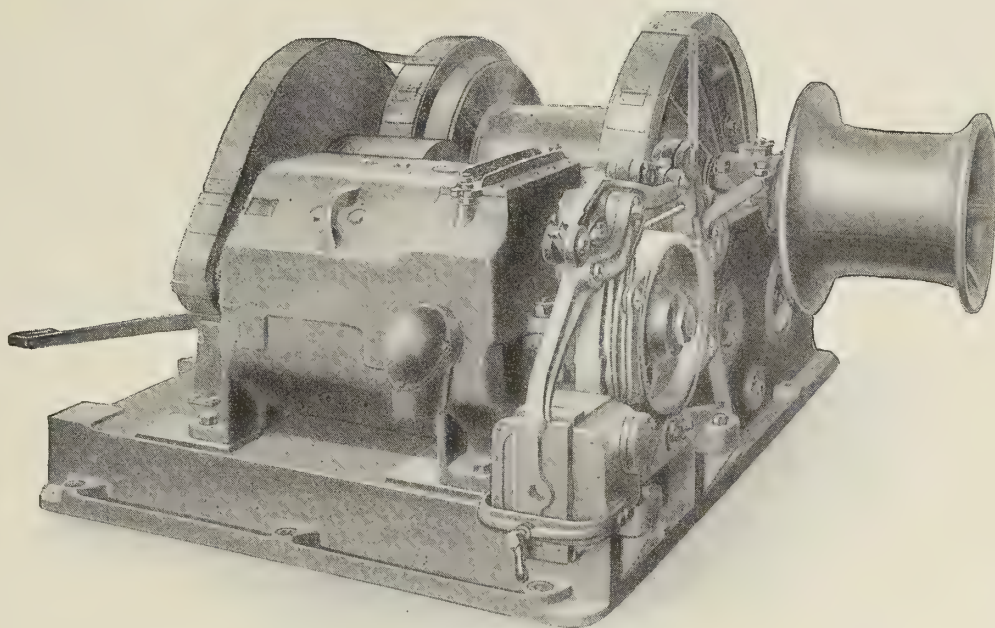
Chadburn's (Ship) Telegraph Company, Ltd., Cyprus Road, Bootle, Liverpool
Turbine Equipment Company, Toronto, Ontario, Canada

Sooner or later you will use a
De Laval



S.S. PARIS
PRIDE OF THE
FRENCH LINE

RUGGED—EFFICIENT—ECONOMICAL



THE A-E-CO WINCH

REQUIRES THE MINIMUM OF ATTENTION

We Also Build

Steering Gear
Telemotors
Windlasses
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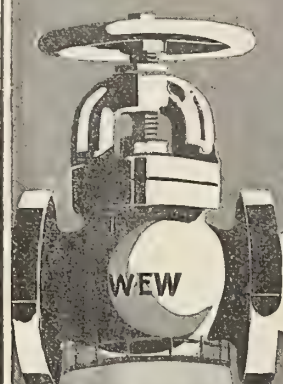
NOTE: *Single drum electric winch with magnetic brake and single gypsy head illustrated. Also built in single or double drum with or without gypsy heads and for either electric, steam, electro-hydraulic, gasoline or hand operation.*

*See Our Exhibit at the
Annual Marine Exposition,
Marine Equipment Association of America,
Central Mercantile Building,
45 West 18th Street, New York City,
Week of November 14, 1921,
Booths 81 and 96.*

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AMERICAN ENGINEERING COMPANY
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BRONZE — IRON — STEEL

VALVES

ALL MADE IN NEW YORK

WILLIAM E. WILLIAMS VALVE CORP.

62 FRONT ST., NEW YORK

**The "W.E.W." LINE of
MARINE MATERIAL**

Consists of Complete Equipments, Such as Valves, Fittings, Fire and Life Saving Apparatus, Wire and Manila Ropes and Hawsers.

We Keep the Largest Stock of Engineers', Deck and Steward Department Supplies in New York. Includes Everything from a Needle to an Anchor.

THE SHIPYARD WITH A TRADITION—FOUNDED IN 1859



Steel Pipe and Coppersmith Shop, Merchant Yard, Chester, Pa.

Merchant Ship Repair Work

MARINE repair work can be promptly effected in the Merchant yard, where long shipbuilding experience is coupled with complete facilities.

Our personnel is trained in every phase of marine building, alteration and repair work, while our technical staff is available at all times for conferences with builders and operators.

Our Quotations will interest you

MERCHANT

SHIPBUILDING CORPORATION

Chester, Pa., or 39 Broadway, New York

**Ask us to bid on
the following:**

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Designs ready for Tankers of 10,000 D. W. T. All kinds of ships up to 15,000 D. W. T. Motorships 11,500 D. W. T. with Diesel Engines. Conversion of Steamships to Diesel. Motorships with Direct or Electric Drive. Repairs and Reconditioning of Ships.

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Hydro-Electric and Related Structural Equipment such as:

High tension transmission towers. Surge tanks—simple and differential types. Penstock pipes. Taintor gates. "v" pipes of special improved design. Large diameter riveted and welded steel pipes.

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Cost—The Deciding Factor For All Boilers

The final cost of a marine boiler is affected by many factors, among which are first cost, fuel cost for steam produced, cleaning and repairing costs, useful life of boiler, and cost of any delay of ship due to boiler repairs, renewals, etc.

It is seldom true that the cheapest in first cost is also the cheapest in final cost, but this is a fact when comparing marine boilers of the Scotch and water-tube types. Not only is the more modern and efficient water-tube boiler operating on present-day steam pressures less expensive in first cost than on Scotch boilers of equal capacity, but its repair cost is less, and it

eliminates the renewal cost required by the short-lived Scotch type. The smaller weight of water-tube boilers results in a larger cargo-carrying and profit-earning capacity, the reduction of which with Scotch boilers should be taken into consideration when determining the final cost of marine boilers.

The first cost of Foster Boilers is not only less than that of similar sized Scotch boilers but the other factors that affect final cost are also less where Foster Boilers are used.

The reason for the low Foster Boiler costs can be readily obtained from our catalog.

FOSTER MARINE BOILER CORPORATION

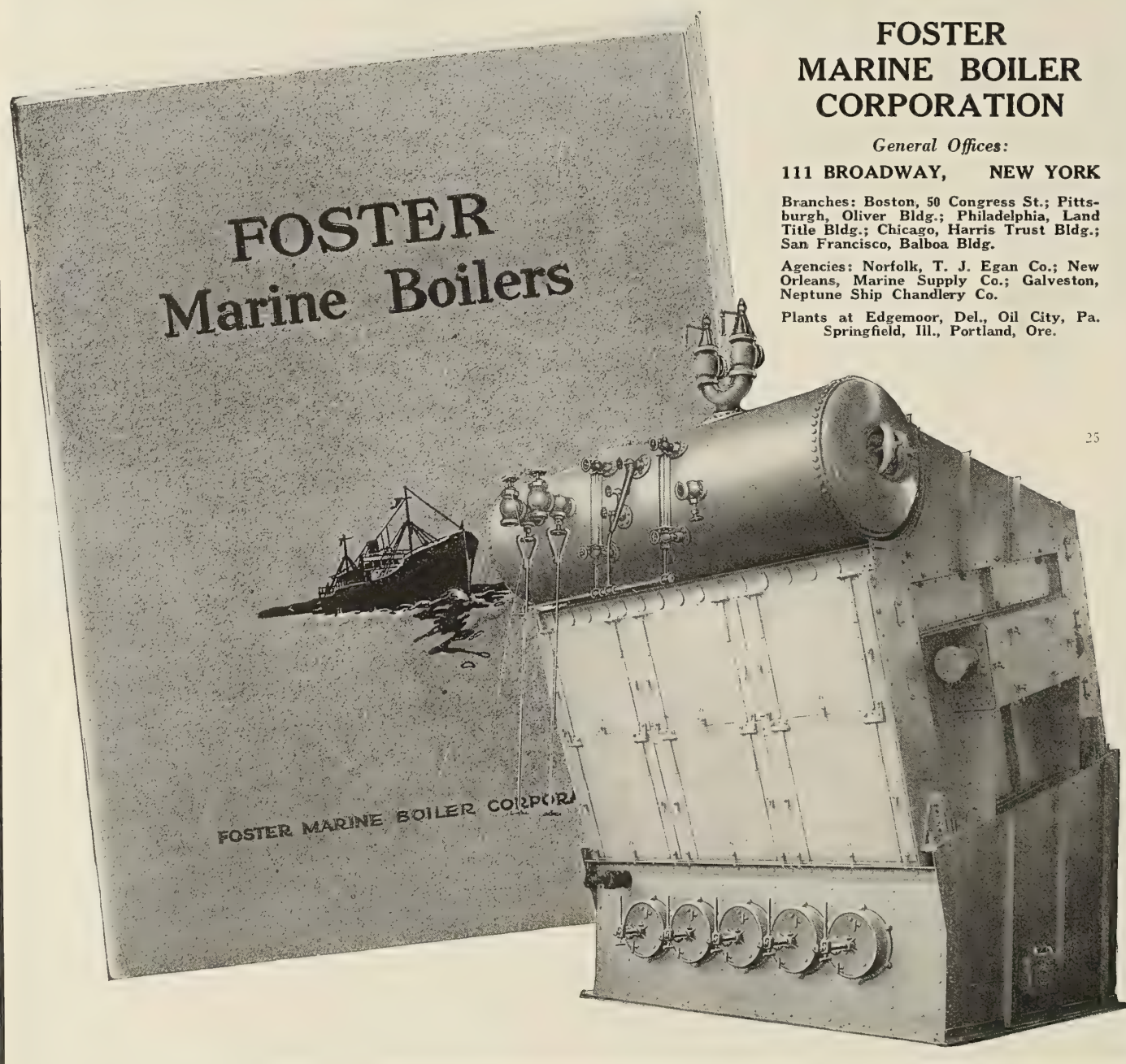
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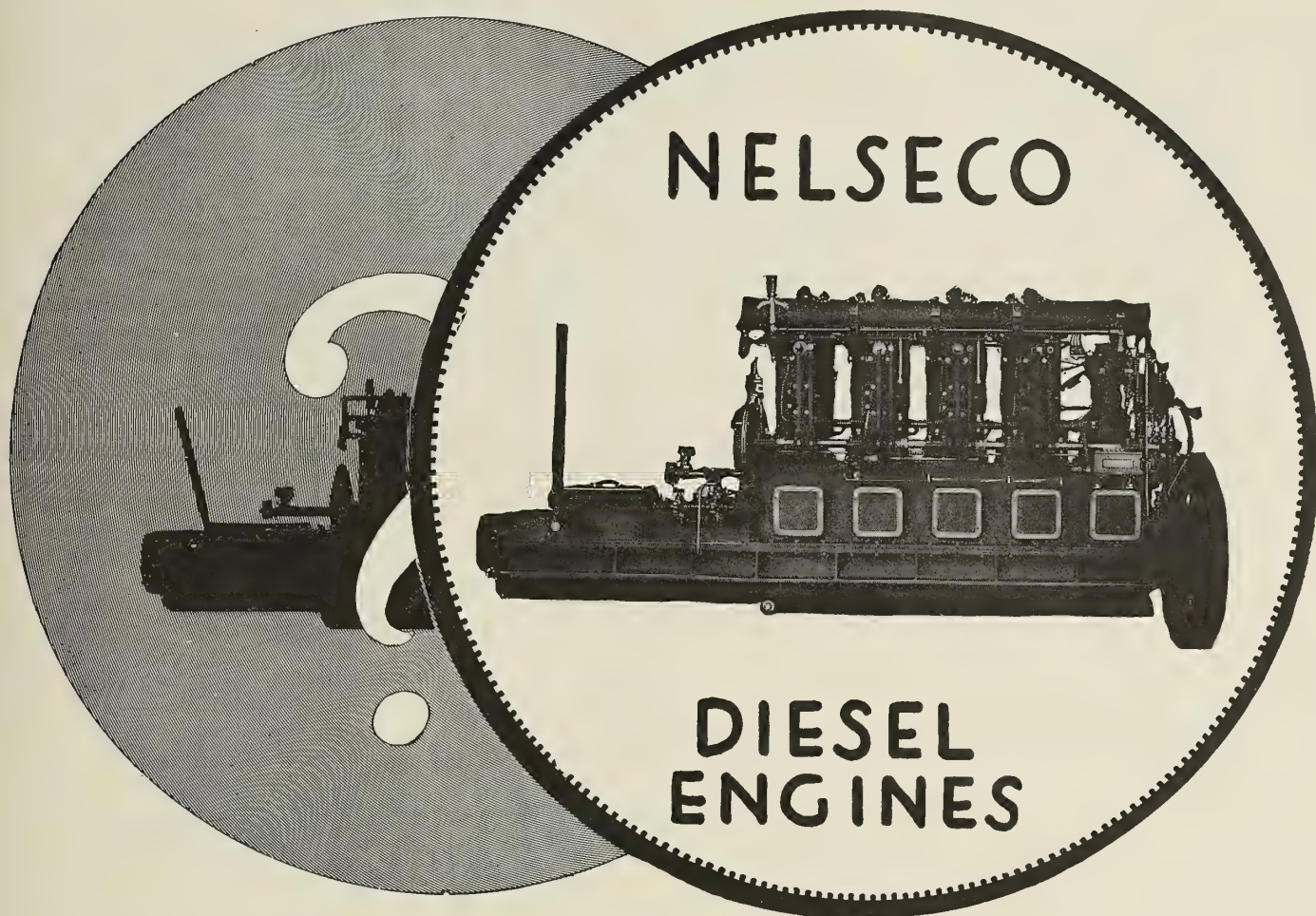
Branches: Boston, 50 Congress St.; Pittsburgh, Oliver Bldg.; Philadelphia, Land Title Bldg.; Chicago, Harris Trust Bldg.; San Francisco, Balboa Bldg.

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BARGAINS IN DIESEL ENGINES



Certainty—

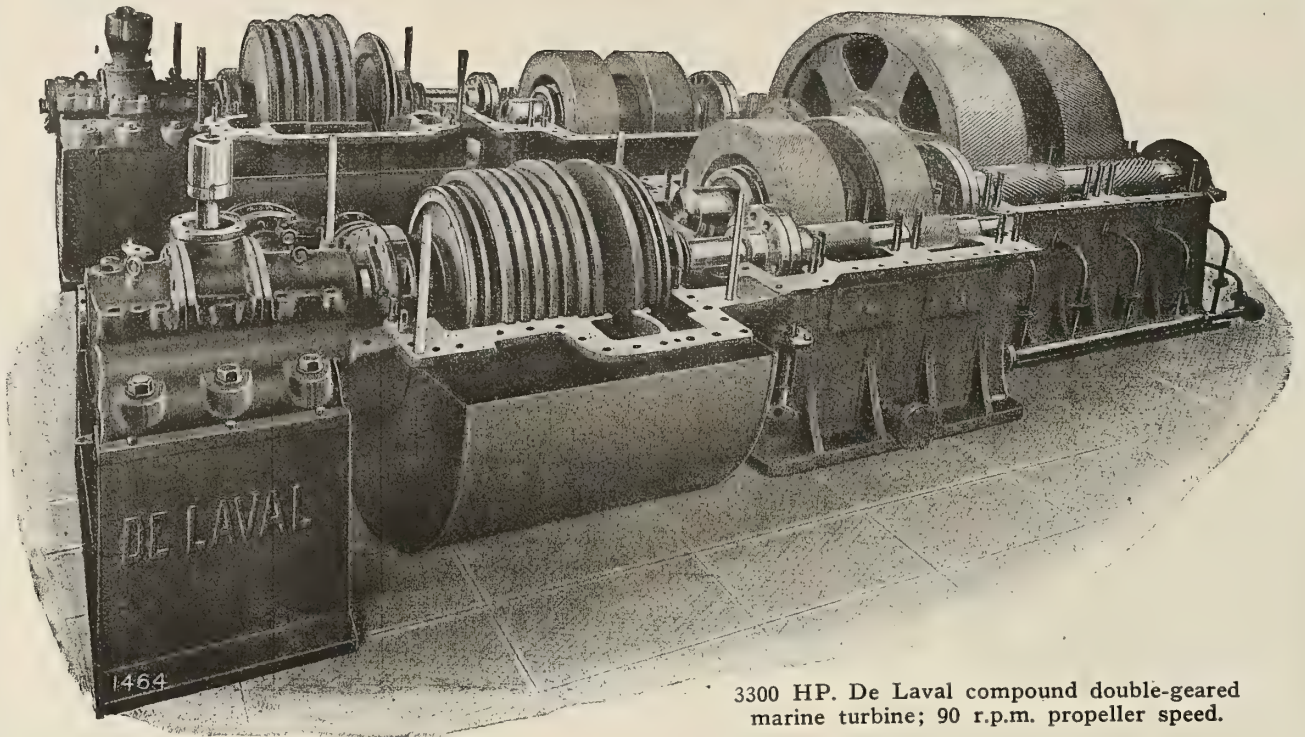
THE SHADOW OF DOUBT
NEVER ENTERS THE MIND OF USERS
OF
NELSECO
MARINE DIESEL ENGINES

In order to move our present stock of engines we are prepared to make a substantial reduction from our regular price. For early delivery.

Ships thus equipped are propelled efficiently and dependably with as low fuel consumption as is possible to secure through any like operation. Over 150,000 H. P. now in service in American and Foreign Vessels or on order.

Sizes: 120, 180, 240, 360, 480 to 2000 B.H.P.

NEW LONDON SHIP & ENGINE CO., Groton, Conn., U. S. A.



3300 HP. De Laval compound double-g geared marine turbine; 90 r.p.m. propeller speed.

This De Laval Compound Double-Geared Marine Turbine

shows high economy in operation, due to its high efficiency and to low expense for attendance and repairs.

It is highly reliable. De Laval gears occupy a unique position in this respect, as there are over 2,000,000 hp. in use and giving entire satisfaction. Many have each traveled over 200,000 miles.

De Laval reduction gears are exceedingly quiet in operation and are highly efficient, as demonstrated by their record in service. Noisy reduction gears greatly reduce the

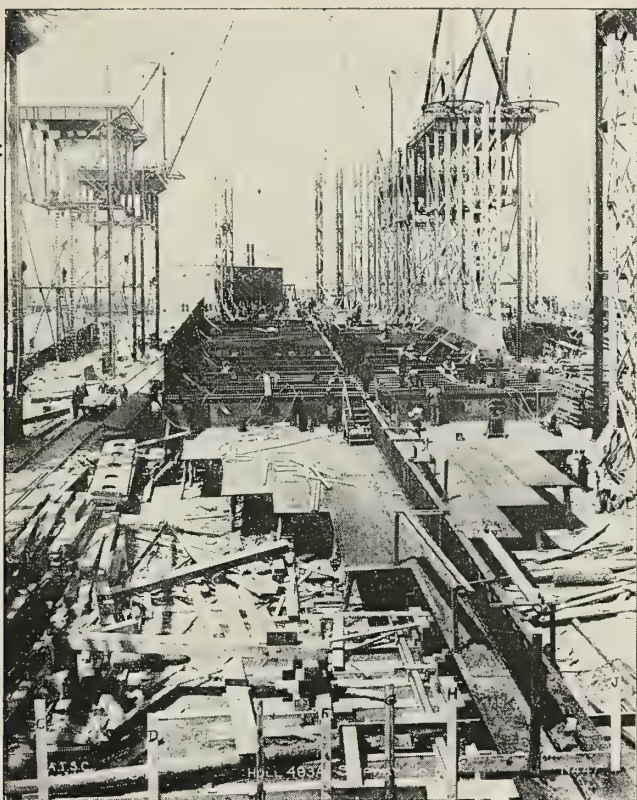
efficiency and morale of engine room crews, who depend upon their hearing more than any other sense to locate trouble.

Either element of the turbine can be operated upon steam at boiler pressure, providing great flexibility and giving the advantages of duplicate power plants. A reversing element on each turbine shaft gives excellent manoeuvring ability. A mechanically interlocking valve gear makes it impossible to admit steam to reversing and ahead elements at the same time.

If you are interested in marine power plants, ask for our Marine Catalog M-46.

De Laval

== Steam Turbine Co. ==
TRENTON, N. J.



Parts of the ship that need extra care in painting

If this picture were in colors there would be red streaks at the places where plates lap.

It is particularly important that contact surfaces be well painted with red-lead before assembly, and that all joints, rivet heads, etc., get an extra coat before the finishing coats are put on.

Ship owners and operators are pretty well agreed that the whole hull should have at least two coats of red-lead, inside and out, regardless of the nature of the final covering.

They know that red-lead adds years to the useful life of a ship.

Dutch Boy Red-Lead gives maximum protection to metal surfaces, and makes an unequalled foundation for finishing coats. Dutch Boy Red-

Lead meets the stiff Navy specifications for purity.

Put up in linseed oil paste and in ready-to-use liquid form. Liquid Red-Lead is regularly made up in six colors—black, light and dark brown, light and dark green, and orange-red—suitable for priming and finishing coats everywhere except where light colors are required; then use Dutch Boy White-Lead.

Where ship owners have adopted a distinctive color for finishing coats, we will supply Liquid Red-Lead especially mixed to match such color.

Specify Dutch Boy Red-Lead—the most economical paint for metal surfaces.

Write for Painting Helps No. 6.



Save the surface and
you save all—*Paint & Varnish*

NATIONAL LEAD COMPANY

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Cleveland

Boston
Buffalo

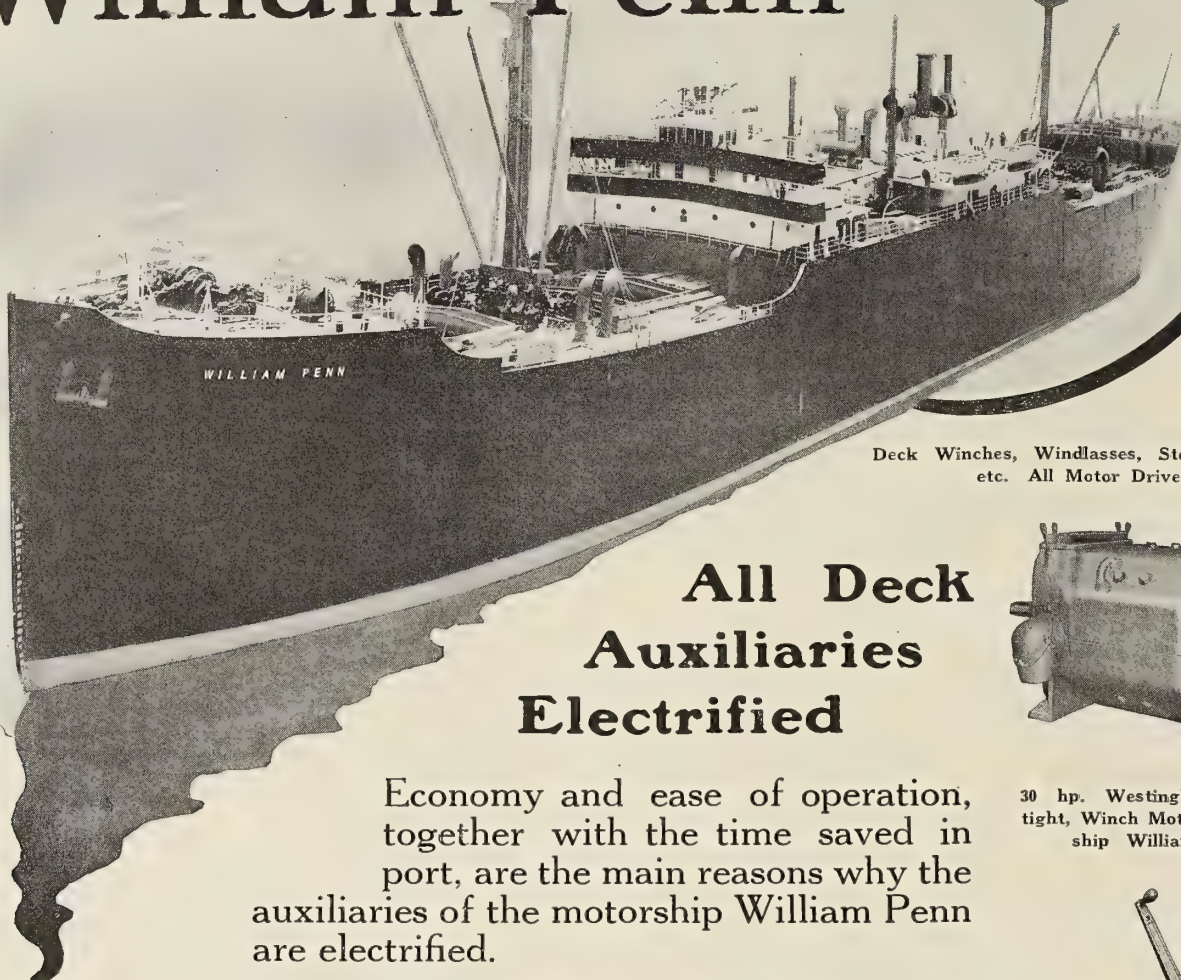
Cincinnati
Chicago

San Francisco
St. Louis

JOHN T. LEWIS & BROS. CO., Philadelphia NATIONAL LEAD & OIL CO., Pittsburgh

Dutch Boy Red-Lead

Motorship William Penn-



Deck Winches, Windlasses, Steering Gear,
etc. All Motor Driven

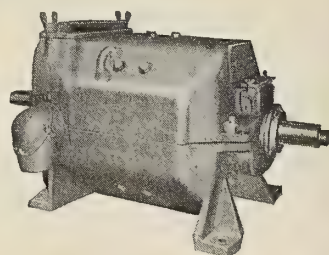
All Deck Auxiliaries Electrified

Economy and ease of operation, together with the time saved in port, are the main reasons why the auxiliaries of the motorship William Penn are electrified.

Electrified auxiliaries dispense with hundreds of feet of steam piping, and piping troubles, such as frozen pipes in winter, condensation losses, leakage, etc.

Electrified auxiliaries are more economical than steam drive, are easier to operate, and are easily applied.

The day is fast coming when all ship auxiliaries will be motor driven.



30 hp. Westinghouse Watertight, Winch Motors on Motorship William Penn.



Westinghouse Watertight, Deck Winch Control on Motorship William Penn

MARINE SERVICE STATIONS

Baltimore, 169 South St.
Newport News, Warwick Pier
New Orleans, 522 Gravier St.
New York, 596 Court St., Brooklyn

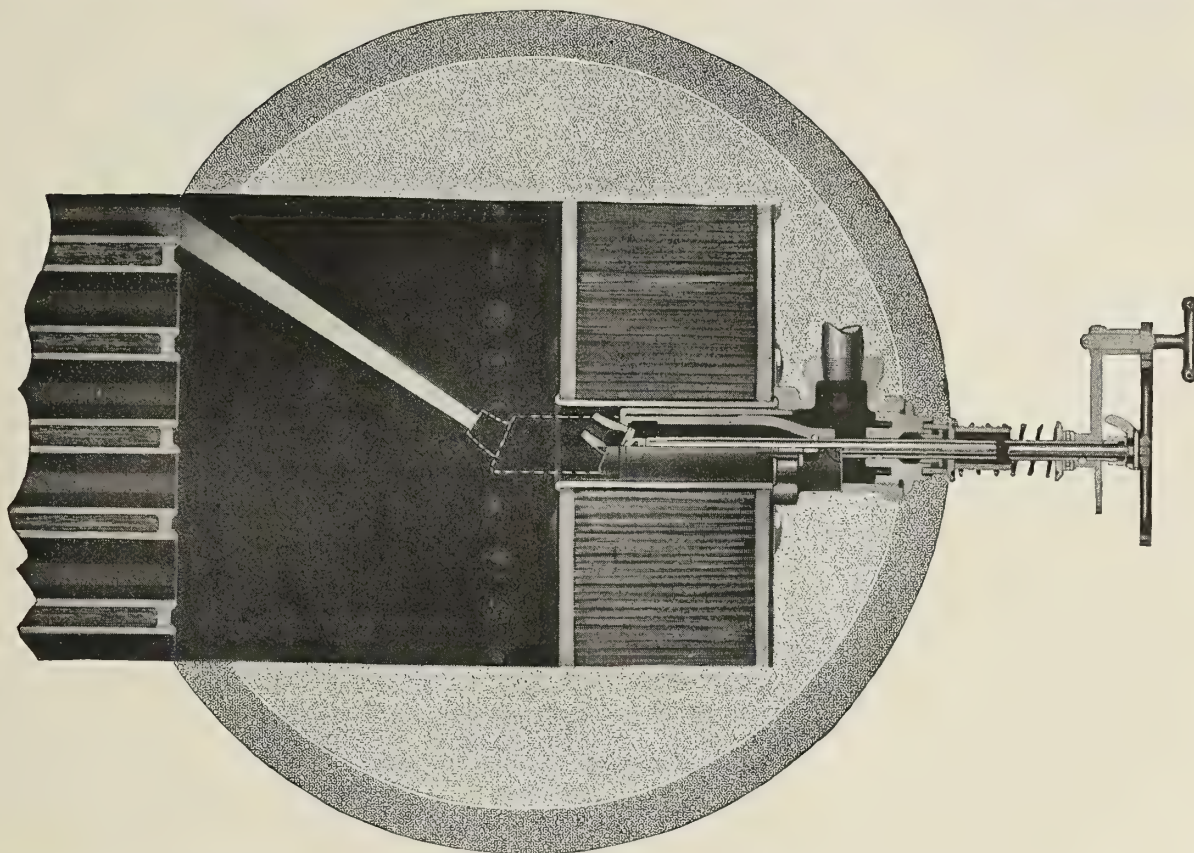
Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Sales Offices in All Principal American Cities
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Westinghouse



SOOT REMOVAL FROM SCOTCH MARINE BOILERS

is effectively accomplished by the improved Diamond Rear End Blower (Model B).

And soot removal is essential to economy. Power is one of the largest items of expense in the cost of operating a vessel, and the cost of fuel represents on the average 70 per cent. of the cost of power. The presence of soot has cost—it still costs—a loss of hundreds of thousands of tons of coal and hundreds of thousands of barrels of fuel oil a year to ship owners. Soot waste has been eliminated on many ships, and it can be eliminated on all with a consequent notable increase in boiler efficiency and a consequent great increase in marine profits.

Thousands of Diamond Model B Blowers are in use today on Scotch Marine boiler. The blower is permanently installed through the rear water leg, a hole being cut in the plates and a section of tubing expanded and beaded into place. The blower is encased in this tubing. When not in use the blower is secreted in the casing. As the steam is turned on the nozzle is automatically forced forward into blowing position. In operation dry steam is shot into each tube with the draft at a terrific velocity, sweeping and scouring the soot from the full length of the tubes.

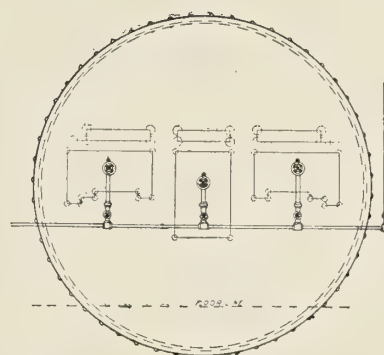
Diamond Soot Blowers save fuel and labor. Write for full information on blowers for any type of boiler, requesting your copy of Bulletin 134, "How Some Ship Owners Have Increased Their Profits."

(New York Address, 90 West St.)

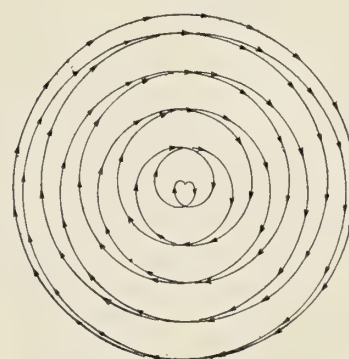
DIAMOND POWER SPECIALTY COMPANY
Detroit, Michigan

Diamond

SOOT BLOWERS - SAVE 4 to 8% FUEL



Method of installing Model B blowers on a three-furnace Scotch boiler.



The arrows show the course of the steam jet as it travels over the tube sheet, blowing every tube.



The World's First Diesel-Electric Cargo Ship

THE reliability and efficiency of Diesel engine-electric drive will soon be further demonstrated on the 2,200 dead weight ton "Fordonian" to be the world's first Diesel-electric cargo ship, now having its Diesel-direct drive replaced by Diesel-electric drive at the Tebo Yacht Basin of the Todd Shipyards Corporation.

The General Electric Company with its many years experience in the marine field was the first to successfully apply Diesel-electric propulsion to ships. The electric equipment for the 150-foot fishing trawler "Mariner" was furnished by this Company and has been in service since February, 1920.

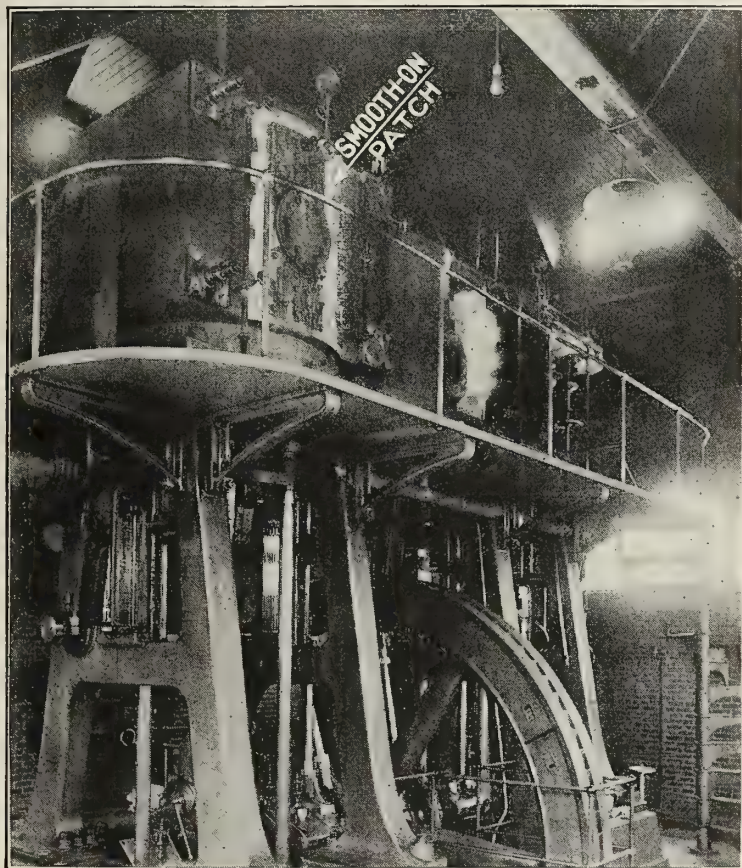
Diesel engine-electric drive with G-E electric equipment was chosen for the "Fordonian" because of its high overall economy, saving in hull space, ease and flexibility of control, and reliability.

The General Electric Company supplies generating and control apparatus, propulsion motors, and motors for engine room and deck auxiliaries of every kind for Diesel-electric ships.

General  Electric
General Office Company Sales Offices in
Schenectady, N.Y. all large cities

SMOOTH-ON IRON CEMENTS

REG. U. S. PAT. OFF.



**“Repaired with
Smooth-On
and never showed
a weep”—**

Writes the Chief Engineer of the West Gloucester (Mass.) Pumping Station. He made a remarkably successful repair on a 42 in. cylinder of a 22x42x30 (see photo) cross compound engine. Not only has the repair proved a permanent one but has saved many dollars against replacing a new part. Read what the Chief says about this Smooth-On repair.

West Gloucester, Mass.
Pumping Station
June 24, 1920.

SMOOTH-ON MFG. CO.
Jersey City, N. J.

GENTLEMEN:

I am sending you today photo. of repairs made on cross compound engine 22 x 42 x 30—four million pump with Smooth-On. This crack started on the 42 in. cylinder, in part under the flange and went to the bottom, then went to the top of cylinder. Laced the crack with copper, which was useless, made two patches with $\frac{1}{4}$ in. boiler plate, poured

lead behind patch. This was unsatisfactory as we had to caulk it every day. As we were going to shut this pump down for two weeks for other repairs, it was then I wrote you for advice, and you advised Smooth-On No. 3 mixed with No. 1, used the same patches, removed the copper lacing and lead, filled crack with No. 1 Smooth-On and let harden, mixed No. 1 and No. 3 as directed, bolted the patch solid, this left a small space between flange and patch. Heated and bent a piece of $1\frac{1}{4}$ in. angle iron to the flange, also to the sweep of cylinder, drilled $4\frac{3}{8}$ cap bolts into edge of flange and slotted the holes in angle iron, drilled $3\frac{1}{2}$ in. cap bolts in face of flange for clamps, filled the space with Smooth-On putty, set clamps and brought angle iron up solid against patch, then set $\frac{3}{8}$ bolts in edge of flange, and we have got a tight and permanent job, have had steam on it now about 6 weeks. It has never showed so much as a weep in any way. The cost, compared with the results obtained, was practically nothing. Will be pleased to answer any inquiries or better still, would like to show it to any one who may call. Thanking you again for your courtesy and advice, I remain

Yours very truly,

F. W. INGERSOLL,
Chief Engineer.

One of the main points in Mr. Ingersoll's letter is his statement—"the cost, compared with the results obtained, was practically nothing." You too, can make economical repairs and save the cost of replacing and labor in your own plant. The new Smooth-On Instruction Book No. 18 shows hundreds of repairs such as occur in boiler and engine rooms every day in the week.

SMOOTH-ON MANUFACTURING CO.

ESTABLISHED 1895

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JERSEY CITY, N. J. U. S. A.

CHICAGO OFFICE
221 N. JEFFERSON STREET

SAN FRANCISCO OFFICE
56 SACRAMENTO STREET

COUPON

294

SMOOTH-ON MANUFACTURING CO.
JERSEY CITY, N. J.

Gentlemen: Kindly send me a free copy of Instruction Book No. 18, as per your November advertisement in Marine Engineering.

Name

Address

THE LATEST in OIL HEATERS

**Cleanable
Pressed Steel Shell Construction
Joints,—one outside, none inside,
No Stuffing Boxes
Indestructible**

The heating of fuel oil before discharging it through oil burners is a necessary operation, consequently your oil heater is a very important part of your oil burning system. Oil is a poor conductor of heat, and in order to heat it efficiently and quickly it should be caused to flow over the heating surfaces in a film-like condition and at a high velocity in order to obtain maximum heat transfer.

On account of the thick and viscous crude oils and residuum which are employed to-day for fuel purposes, this maximum heat transfer will not maintain unless the heating surfaces of your heater can be kept clean. Would you have a boiler in your plant whose heating surfaces could not be cleaned?

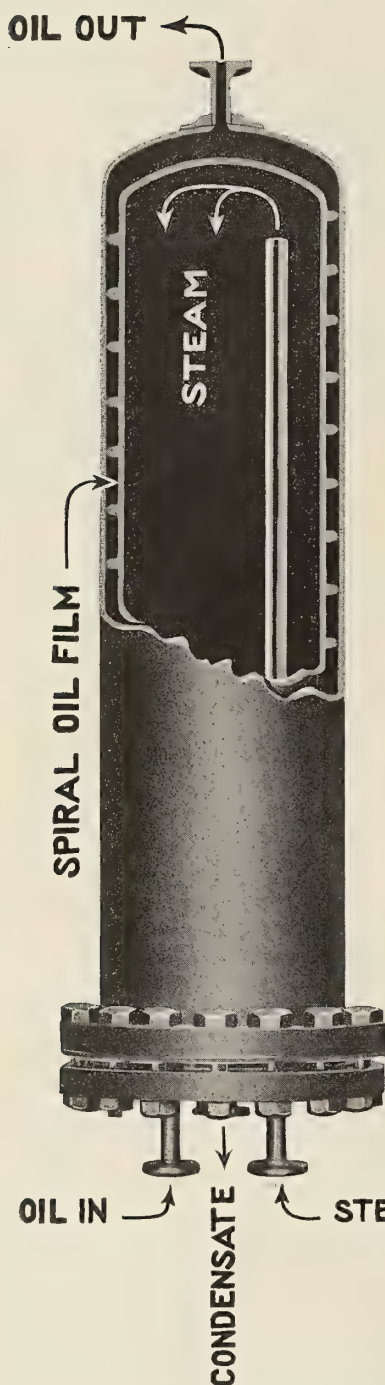
This latest "COEN" product is the result of years of scientific experimenting and testing, and in offering it to you we offer an oil heater that for Efficiency, Economy, Strength and Durability has no equal.

Our representatives
will be glad to give you free information.

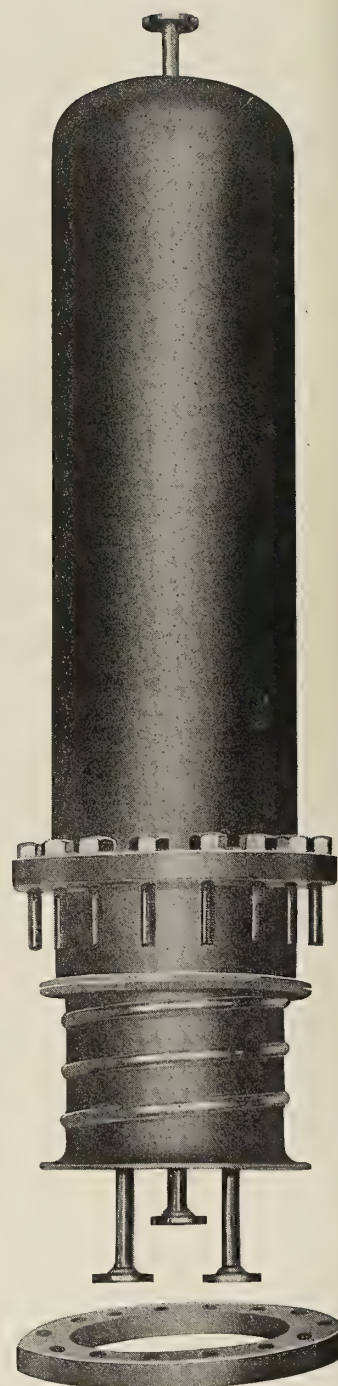
CALL ON US AT BOOTH 136

**ANNUAL MARINE EXPOSITION
WEEK OF NOV. 14**

Central Mercantile Bldg. New York City



Pat. Applied for



Heating Surface Exposed

COEN COMPANY, Inc.

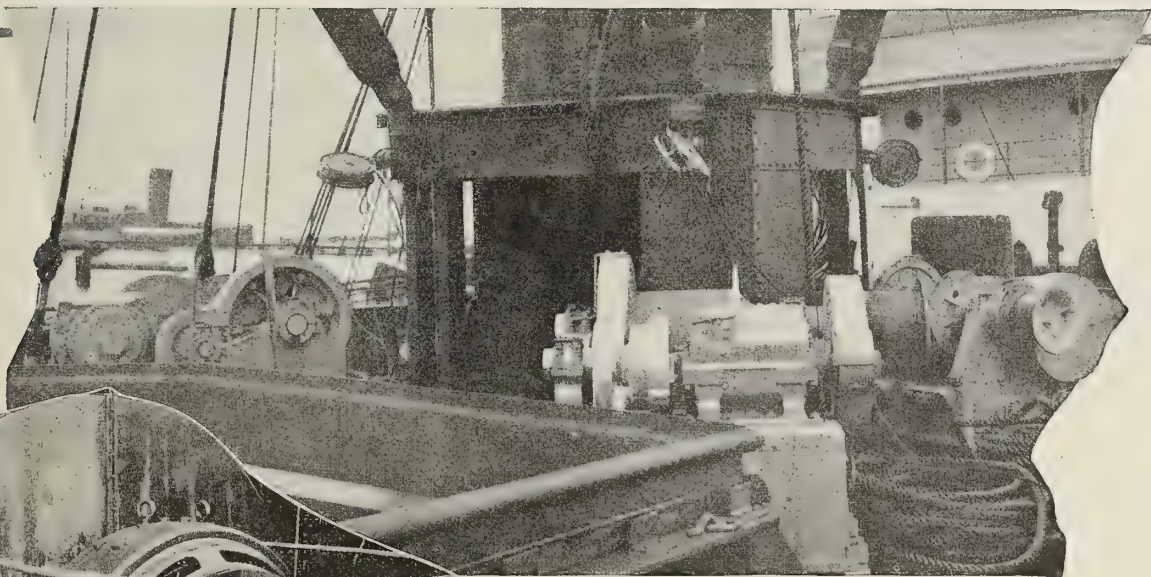
Oil Burning Equipment

SAN FRANCISCO

NEW YORK

LOS ANGELES

To meet keen competition, economical operation is as essential to ships as to modern factories



A typical installation of G-E motor driven cargo winches

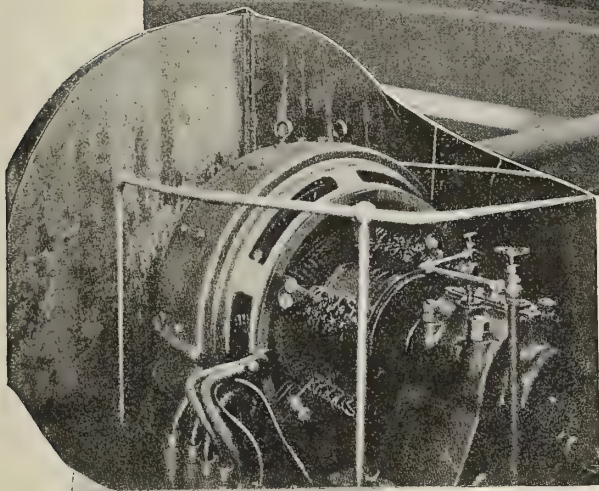
Electricity Makes Good Ships Better

Why do owners and masters of ships equipped with steam driven auxiliaries strive to save time, fuel and labor, to prevent losses from condensation, throttling, radiation, leakage, and low efficiency when it all can be accomplished so easily with electricity?

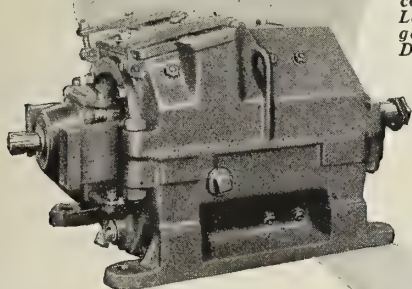
G-E Marine Generators, Motors and Control Apparatus are built for sea service, rugged, compact, safe, always ready, easy to control, and have proved all claims made for them.

This is fully realized by men who, with electric power, operate anchor windlasses, cargo winches, boathoists, steering gears, warping and mooring winches, pumps, cranes, blowers, machine tools, fans, and other auxiliaries.

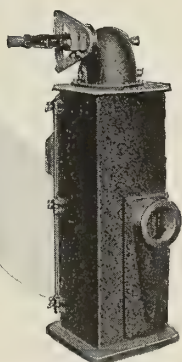
*The electric way is the modern way—
the proved economical way*



G-E Generator direct connected to engine. Larger sizes of this generator are used for Diesel Electric Drive



G-E Watertight D-C Motor with hinged cover which provides easy access to working parts



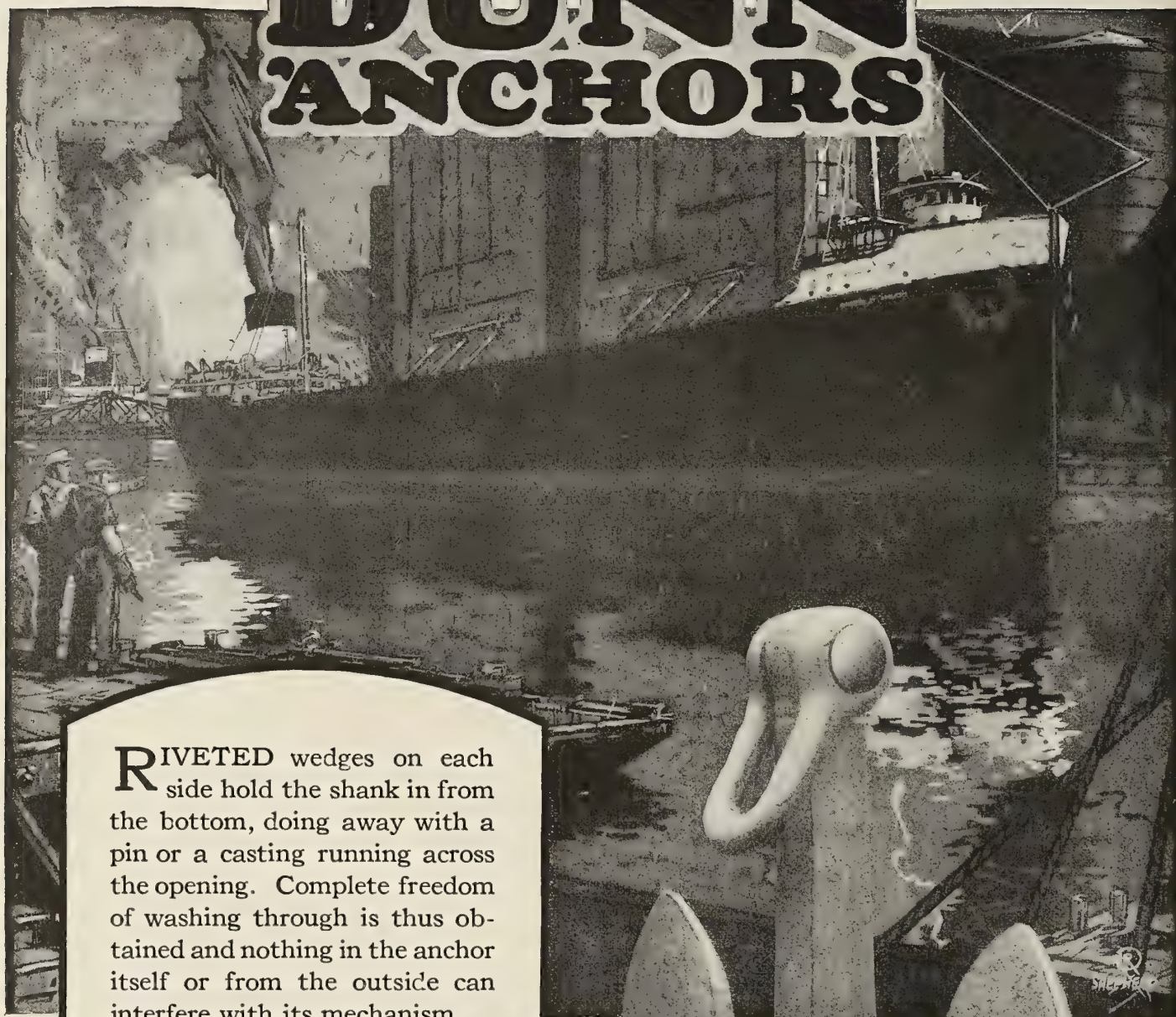
G-E Watertight Drum Controller

General Electric Company

General Office
Schenectady, N.Y.

Sales Offices in
all large cities

DUNN ANCHORS



RIVETED wedges on each side hold the shank in from the bottom, doing away with a pin or a casting running across the opening. Complete freedom of washing through is thus obtained and nothing in the anchor itself or from the outside can interfere with its mechanism.

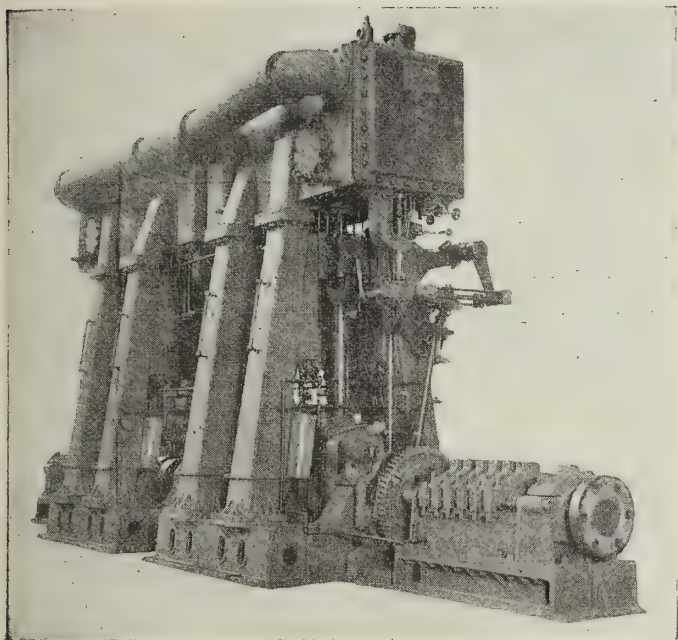
On the seas and on inland waterways, Dunn Anchors occupy a well recognized place in modern seamanship.

**American Steel
Foundries**

New York Chester, Pa.
CHICAGO



Marine Equipment



Main Engines and Auxiliaries

Twin Compound Engines furnished by the Kearfott Engineering Co., Inc., for the new Boston Municipal Ferry Boats.

The Kearfott Engineering Co., Inc., is prepared to furnish complete machinery equipment for all classes of steam vessels.

Engines—main and auxiliary—for vessels large or small.

Surface condensers—all sizes for marine installation—steel or cast iron shells.

Propellers, cast iron or bronze—made in our foundry and shops at Hoboken, N. J. Shafting, stern tubes, brass liners and bearings.

Turbine driven fans, pumps and generator sets—Grate bars and miscellaneous gray iron castings.

We can supply from stock on hand—

Chase condenser tubes — Admiralty or Muntz Metal.

Condenser tube ferrules.

Boiler tubes—charcoal iron—lap welded or seamless steel.

We can supply a large stock of semi-steel propellers.

The character of service we have to offer is evidenced in the furnishing of machinery equipment for the Boston Municipal Ferry Boats, described in this issue.

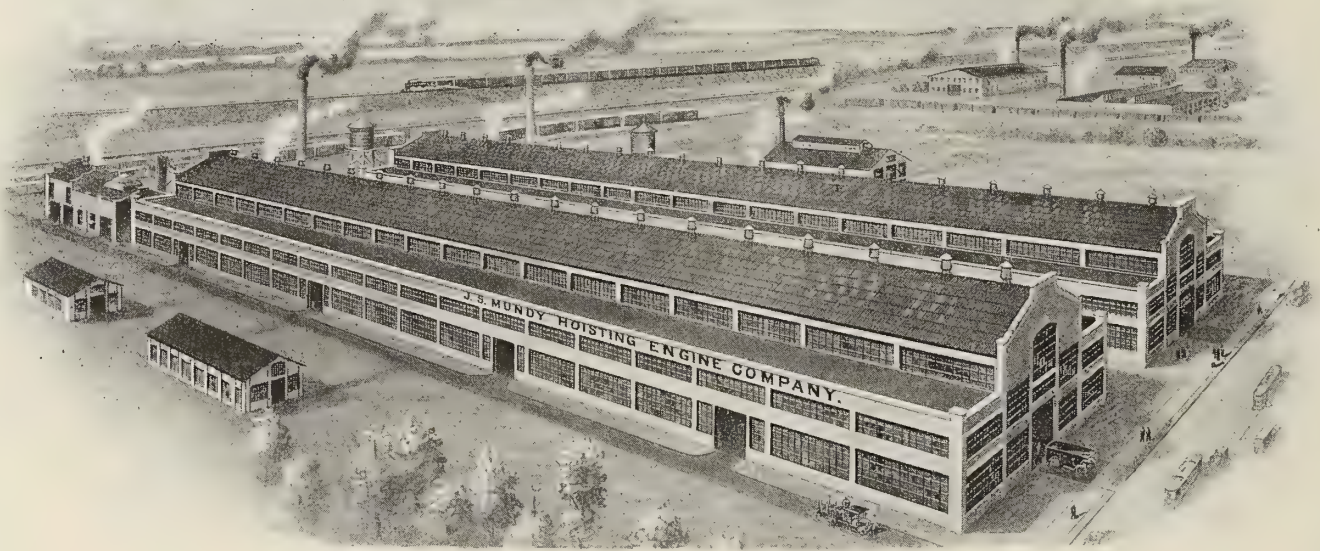
Kearfott Engineering Co., Inc. 95 Liberty Street New York

KEARFOTT
MARINE MACHINERY

Frederick D. Herbert, President



HOME OF M TRADE MARK U N D Y MARINE ESTABLISHED 1869 AUXILIARIES



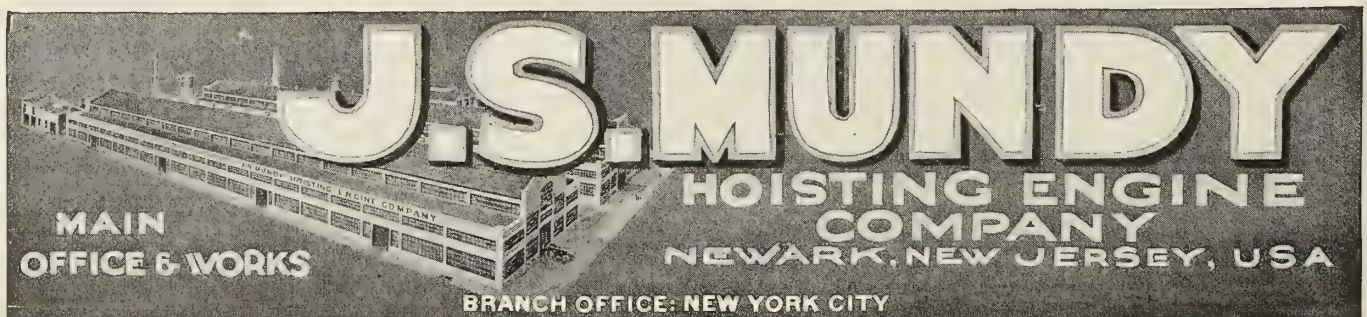
We Manufacture Steam and Electric

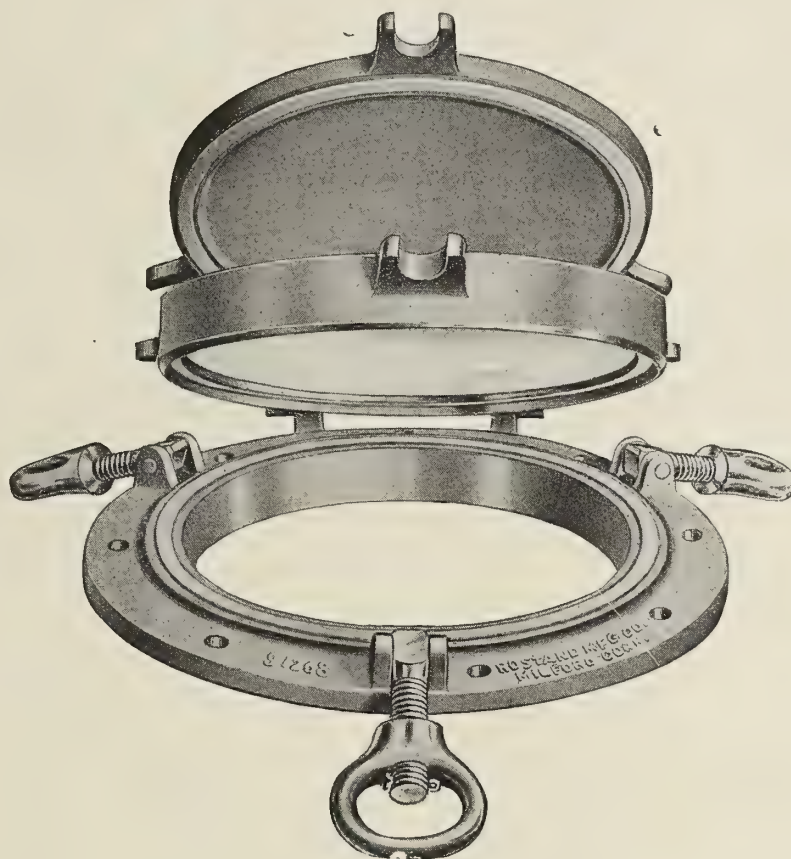
Steering Engines
Capstans
Hydraulic Telemotors

Windlasses
Cargo Winches
Ash Hoists

See Our Exhibit at the Annual Marine Exposition

MARINE EQUIPMENT ASSOCIATION OF AMERICA
CENTRAL MERCANTILE BUILDING 45 West 18th St., N. Y. C.
WEEK OF NOVEMBER 14TH, 1921





A ship builder knows what this is.

**We make them in all sizes and
styles, and to suit any
requirements.**

The Rostand Mfg. Co.
MILFORD CONN.



Marine Plumbing Fixtures and Specialties

the recognized standard for every type
and size pleasure and commercial craft.

—Important—

Those interested in Marine sanitation
should make application for copy of our
Marine Plumbing Catalogue. We invite
all inquiries.

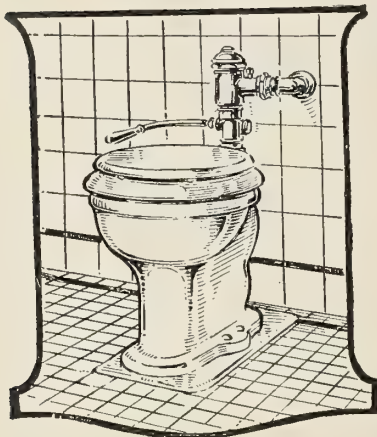


Plate F-3904

The "Alva" syphon jet water closet, vitro adamant pedestal bowl, cellul white seat and cover with N. P. brass heavy pattern hinges. Sands improved "Utilis" N. P. composition flush valve, arranged to give back or side inlet connection. Heavy brass deck plate with bolts and china bolt caps. Porcelain deck slab.....\$75.00



Plate F-1230 — The "Commercial" closet for above water line. Vitro-adamant flushing rim oval hopper, galvanized iron valve box; galvanized iron base plate. Handle galvanized malleable iron; operates composition quick opening non-hammering supply valve and waste pan; fitted with I. P. connection; painted white; trimmings N. P.; heavy oak seat and cover....\$82.50



Plate F-295

Plate F-295—The Ubmarine, 2 feet N. P. brass single tube water heater; brass outer tube and copper inner tube, with bulkhead brackets. \$30.00

Plate F-296—The Ubmarine, 3 feet long....\$35.00

Plate F-297—The Ubmarine, 4 feet long....\$40.00

Heaters designed to stand a pressure of 100 lbs. per square inch, and capable of raising the temperature of water from 40° F. to 105° F. at the rate of 3 to 10 gallons per minute with a steam pressure of 20 to 25 pounds per square inch.

Connections. $\frac{3}{4}$ " I. P. size steam; and water $\frac{1}{2}$ " I. P. drain.

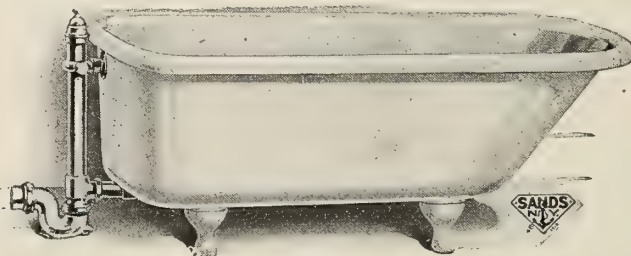


Plate F-20

The "Valeria" porcelain enameled iron bath tub, rolled rim; with flat bottom. Special marine legs, arranged to bolt to deck; painted outside; N. P. brass standing waste and overflow, china index; with supply spout, yoke arranged for $\frac{3}{4}$ " I. P. supply at right or left hand; 2" N. P. cast brass, half "S" trap with plug and ground joint union on outlet for I. P. connection. Tubs 4'-6", 5'-0" and 5'-6" long; 26" and 30" wide as required.

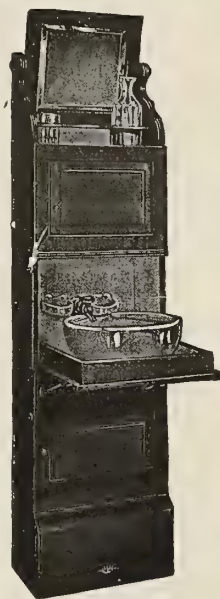


Plate F-688

"Alcona Folding" Lavatory, zinc reservoir and waste receiver, vitro-adamant basin, china soap holders, self-closing supply faucet. Polished quartered oak and mahogany. Price upon application. An ideal fixture for state-rooms.

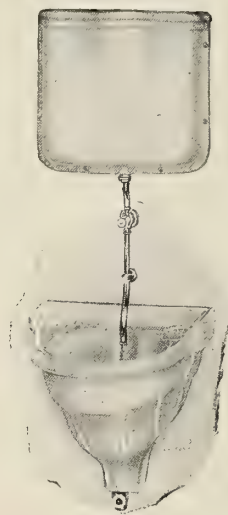


Plate F-680

The "Jefferson" state-room lavatory outfit; vitro-adamant basin with two moulded soap dishes; recessed outlet; iron waste receiver, enameled inside and painted outside; brass waste cock; vitro-adamant three-gallon reservoir with N. P. brass bulkhead screws and washers. N. P. brass self-closing push button supply. See Plate F-675. Price upon application.



Plate F-2035

Automatic backwater 4" check valves. Made in galvanized iron and composition. These are fitted with composition valve with clean-out cover.

(Prices upon application.)



Plate F-2036

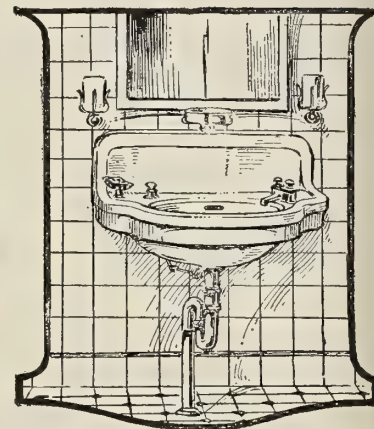


Plate F-565

The "Stanley" vitro-adamant lavatory with overlap slab, integral back. "Sanos" overflow, concealed hanger, painted bulkhead supports, push button "Twino" faucet with china indexes "Hot" and "Cold"; N. P. brass soap dish; "Improve" pop-up waste, N. P. cast brass swivel trap. Price.....\$59.50

Dimensions; Slab, 24"x15"; back to front, 15"; oval basin, 12"x15"; rear outlet, back 6" high.

Can be furnished with single faucet for cold water only.

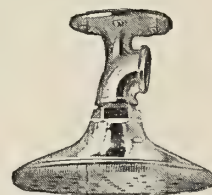


Plate F-285

Plate F-285—Sands N. P. cast brass shower head removable face, deck ceiling flange. Iron pipe side inlet connection.

5" head, $\frac{1}{2}$ " inlet.....\$5.75
6" head, $\frac{3}{4}$ " inlet.....\$6.75

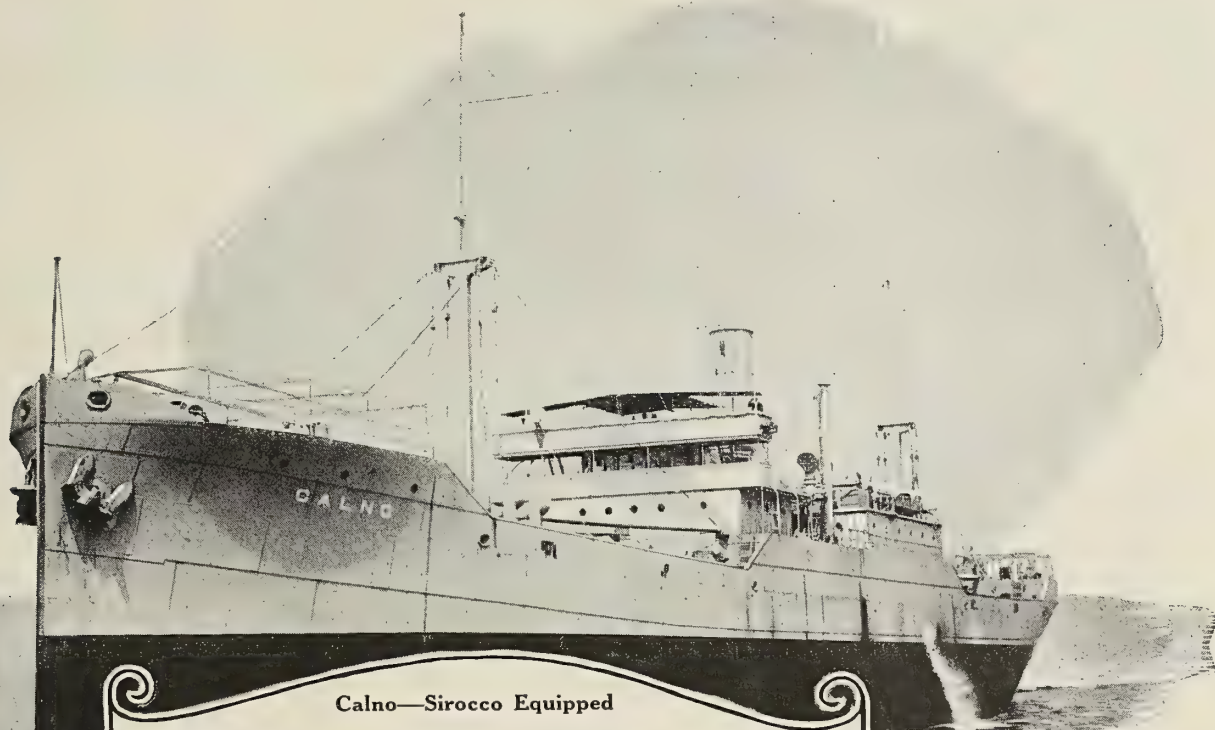


Plate F-1468—Sands flat rim porcelain enameled or galvanized iron deep sinks with 2" center outlet. Brass stopper $\frac{1}{4}$ " I. P. connection.

16"x16"x10"	\$11.50
24"x16"x10"	14.00
26"x20"x10"	17.50
20"x14"x12"	12.50
20"x16"x12"	14.50
24"x20"x12"	18.00
30"x20"x12"	26.00
36"x20"x12"	31.00

Specify size and kind.

A. B. SANDS & SON COMPANY
22-24 Vesey Street New York, N. Y.



Calno—Sirocco Equipped

VENTILATING THE MODERN SHIP

The need for right ventilation on ship-board is more apparent today than ever before.

On the freighter, the cargo must have a dependable supply of fresh air—interior chambers must be dried and kept dry, gases and vapors from bulk or package goods must be removed.

On the passenger boat the comfort and health of passengers means that a dependable system of ventilation must be at hand—whether at the dock or at sea.

Climatic changes on the sea-going vessel, to which all ships are subject, demand forced and positive ventilation for the sake of quality of the cargo or comfort of the passengers.

"Sirocco"
TRADE MARK.

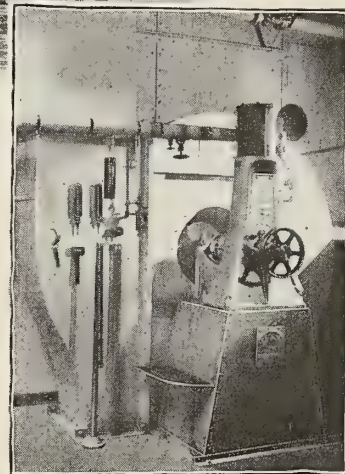
Sirocco fans, blowers and air-washers furnish this dependable ventilation for any type of boat. Aside from ventilation, "A B C" engines are used to operate the "Sirocco" forced draft fans for boilers.

This whole subject of ventilation is covered in our booklet "A B C Equipment for Ships." A copy will be sent you on request.

AMERICAN BLOWER COMPANY

Detroit, Michigan

"Sirocco"
TRADE MARK



A. B. C. Engine Operating
Sirocco Fan on Board Ship

Will Your Condenser Tubes Season Crack? Try These Tests

Flattening Test Cut off a section about 4 inches long from a condenser tube. Hammer flat one end of it, then hammer the opposite end. If the metal cracks, it indicates a defect or else extreme hardness. Hard drawn tubing is usually associated with season cracking.

Accelerated Corrosion Test Immerse a small section of tubing for 15 minutes in a 10 per cent solution of mercurous nitrate solution. If severe strains are present in the metal, the tube will crack in a manner similar to season cracking. This test was used by the United States government in testing 75 mm. brass shrapnel cases to determine whether they would deteriorate in storage. We will be pleased to furnish full directions for making up this solution.

Scovill Tubing

is a product based on knowledge acquired after a century of brass making. Owing to the fact that it has been relieved from drawing strains, it will not season crack. Furthermore its extremely fine grain offers greater resistance to corrosion, resulting in longer life. It pays to buy condenser tubes on the basis of length of service rather than initial cost.

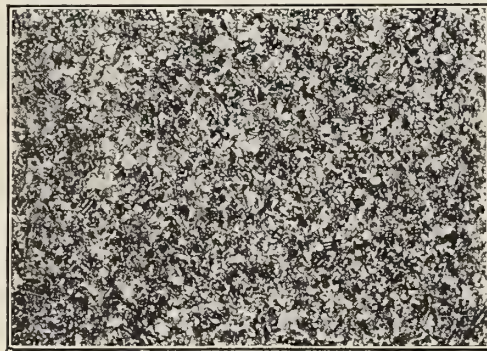


Illustration shows micrograph of specimen of our condenser tubing: magnification 75 X, note the dense crystalline structure.

We will display our tubing at the Annual Marine Exposition, Central Mercantile Bldg., 45 West 18th St., New York City, Nov. 14th to 19th, 1921, Booth 111. Several interesting tests will be shown.

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SCOVILL MANUFACTURING COMPANY

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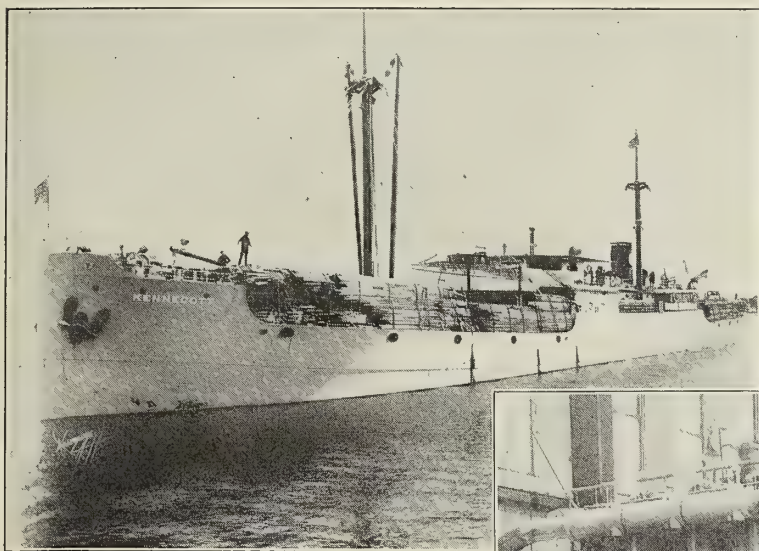
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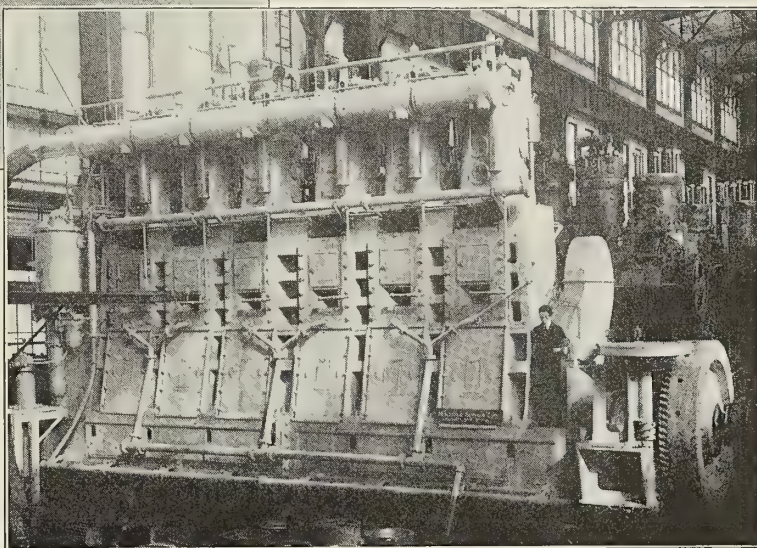
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Motorship Kennecott
The most efficient ship that
sails the seas

This vessel is engined with two
of our 1200 IHP Diesel Marine
Engines



THE Motorship Kennecott, with her efficient McIntosh & Seymour Diesel Marine Engines, carries a ton of cargo 572 miles on one gallon of fuel oil.

Diesel driven Motorships can operate at a profit when freight rates are so low that steamship competition is rapidly eliminated.

We Build

DIESEL MARINE ENGINES

FOR ALL CLASSES OF SHIPS

IN SIZES FROM

390 TO 3000 HORSE POWER

MCINTOSH & SEYMOUR CORP.

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149 BROADWAY
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815 SHELDON BLDG.
SAN FRANCISCO, CAL.

412 BISBEE BLDG.
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Photo by Edw. Levick, N. Y.

One of the Emergency Fleet wooden steamships that may soon be sold at bargain prices.

Over 80% of these boats are caulked with STRATFORD OAKUM which made a war record of not a single complaint or rejection and receives the highest approval of both Lloyd's and American Bureau.

STRATFORD OAKUM contains least waste, requires least labor and is the best and most economical caulking material to be had at any price.

George Stratford Oakum Co.

Jersey City, N. J.

Who is using the Pneumercator System?

The Pneumercator Draft Gauge

gives you the fore, aft and mean draft, without your leaving the ship—it weighs bulk cargoes loaded or discharged—bunker coal, ballast. It shows trim and list—the effectiveness of pumps in case of leaks or collision.—May be placed in any convenient place aboard ship.

The Pneumercator Tank Gauge

keeps tabs on your hourly consumption of fuel oil—checks invoices and withdrawals. No danger of running low without forewarning—no flooding of decks—no guessing at some oil smeared mark on a sounding rod. Can be placed wherever convenient. Safe—Accurate—dependable.

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U. S. Shipping Board
U. S. Revenue Service
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Union Sulphur Company
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In addition to the above our European representative, Messrs. Kelvin, Bottomley & Baird, Ltd., have furnished among others, the following:

Cunard Line	United Fruit Co.
White Star Line	French Line
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Canadian Pacific Steamship Co.	

Including

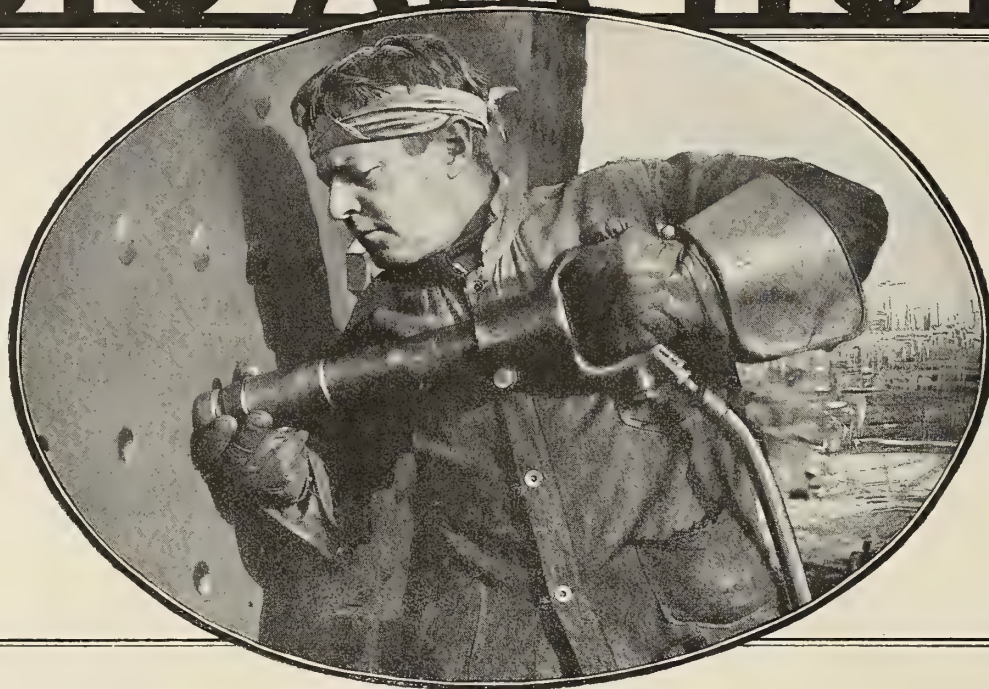
S.S. Aquitania	S.S. San Blas
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Over 4000 Instruments Installed on 550 Vessels

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Week of November 14, 1921

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48-10 AIR HOSE



In Constant Service Where Ships are Built

A tough rubber cover built to withstand abrasion and offering the greatest resistance to wear—

An oil-proof inner tube which cannot separate from the braid—

An extreme strength resulting in unusual length of service, yet so flexible that it will easily bend around any obstruction without kinking —

All characteristic of 48-10 the most dependable air hose that it is possible to produce.

United States Rubber Company

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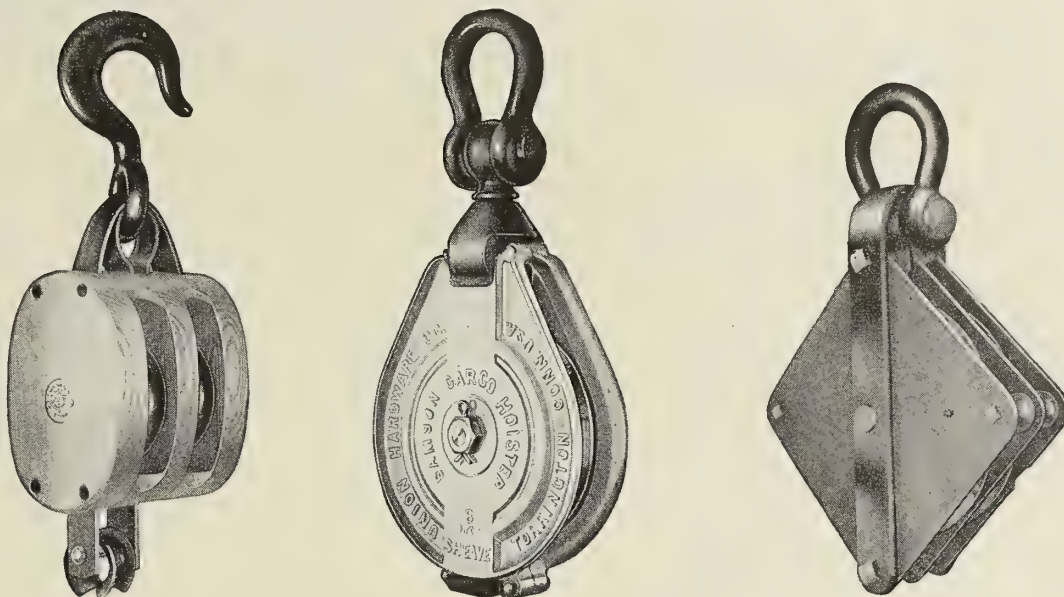
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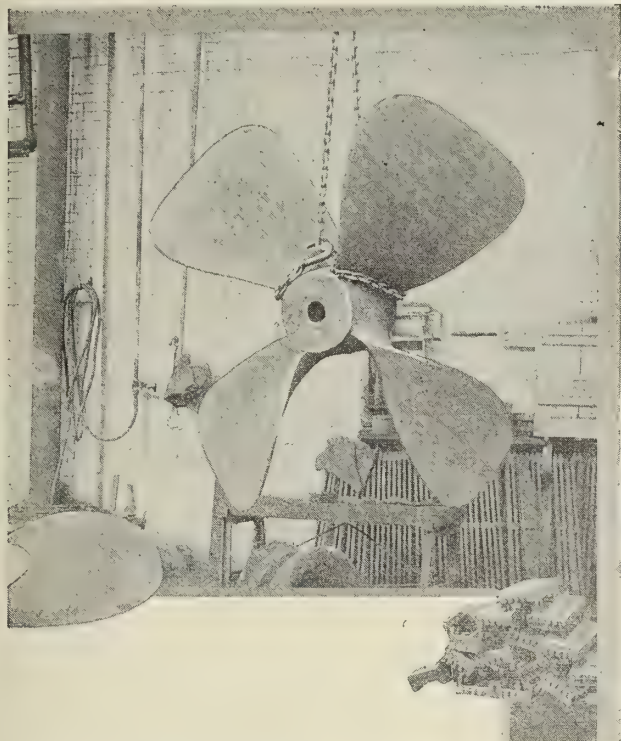
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Don't Wait Until It Is Too Late— Order That Wheel or Blade NOW!

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Order that spare blade or wheel now! We have exceptional facilities and are ready to execute your order for cast iron or bronze wheels or blades at short notice.

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Grate Bars,
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Any kind of light or
heavy machinery?**

We are ready.

Write or phone us now. Cortland 3415.

Ferguson-Herbert Corp.

JOHN FERGUSON—FREDERICK D. HERBERT

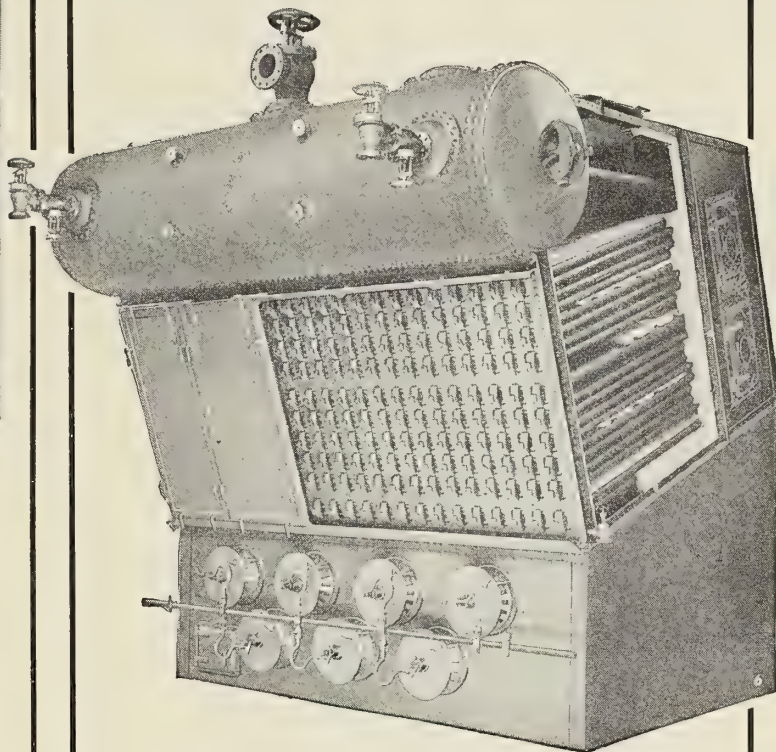
Foundry and Machine Shop

Hoboken, N. J.

New York Office—95 Liberty St.

The Ward Watertube Boiler

**Gives An Evaporation Test of 16.73
Lbs. of Water to 1 Lb. of Oil**



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There are two points to bear in mind in this connection—

- (1) that this efficiency is due largely to the excellent design and construction of structural parts and assembly of the Ward Boiler—and
- (2) that all Ward Boilers are built alike and any one of them can render as good a performance as the above tests show.

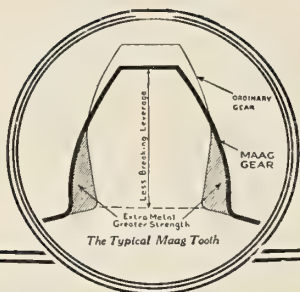
You will want to know why this high evaporation is possible—let us tell you now. Write today.

The Charles Ward Eng. Works
Charleston, W. Va.

Eastern Agent

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95 Liberty St., New York, N. Y.



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You need strong, slow wearing, long-lived gears in your equipment. Maag Gears are produced in sizes from 2 inches to 40 feet in diameter and in spur, helical, spiral and herringbone types—a selection to cover any of your needs.

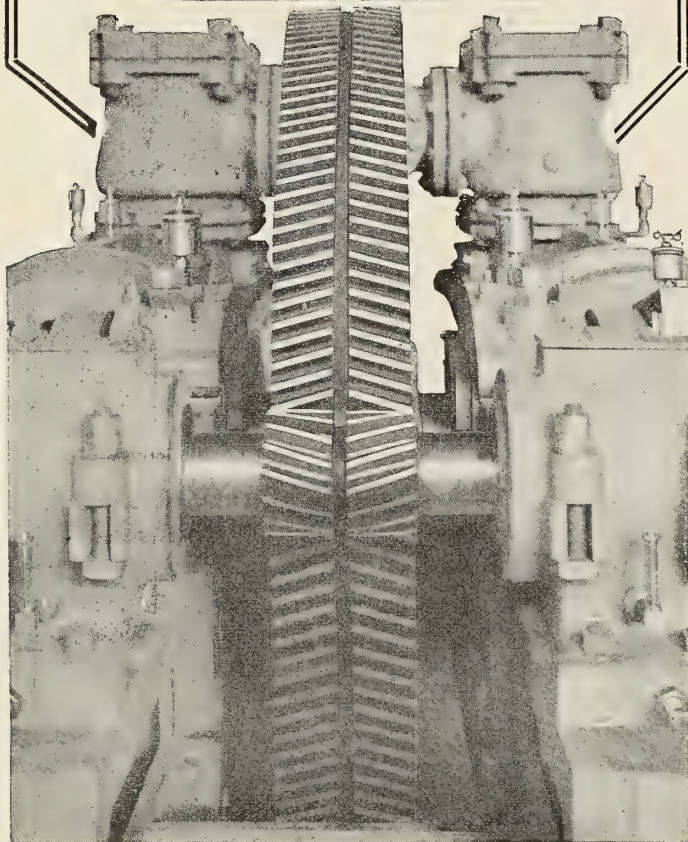
Catalogue No. 265 tells the Maag Gear Story—we'll be glad to send it anywhere you say.

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Somewhere in the Marine Field there is a young man, a salesman who has the entree to offices of Steamship Companies, shipyards and repair yards. We want this man. There is a future and a permanent position for the man who can get results, take over the sales end and consistently and permanently increase the company's business. Location, New York. In applying, please give full details of experience and complete business history. Address Box 91, Marine Engineering and Shipping Age, Woolworth Building, New York, N. Y.

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We need the services of a high-grade man who can get aboard ships and sell our product to the engineers and deck officers. If you can do this address Box 92, Marine Engineering and Shipping Age, Woolworth Building, New York, N. Y.

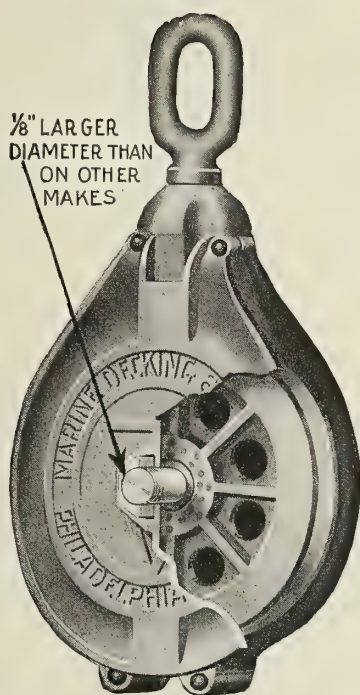
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“THIS TRADE MARK”

WHICH ASSURES YOU OF—

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HONESTY
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“Quaker Cargo Hoister”



The Mark of Service and Quality

The Madesco Block was designed primarily for use on ships, and the experience gained in manufacturing these rugged blocks has dictated that the entire line of Madesco Blocks, whether for use on ships or elsewhere, shall be of the same high character of construction and material.

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Marine Decking & Supply Company

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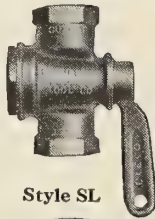
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PRESSURE-SEATED AIR VALVES

THE VALVE THAT NEVER LEAKS



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Style FW

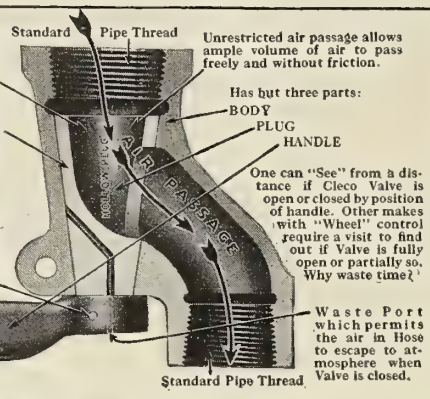


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Handle is pinned on solid end of Plug. No "nut" as in the ordinary Plug Cock for men to tamper with or to get loose, allowing plug to get off seat and cause leakage.



Style LW



Style FWL



Style RA

Write for Illustrated Bulletin No. 48

There is a Cleco Valve made for every need on Air Systems, from Compressor to the Air Tool and for Hose Lines.



Style PO

Multiple Outlet Valves are made in all sizes for Machines having Double-Acting Pistons and for Foundry Molding Machines.

THE CLEVELAND PNEUMATIC TOOL COMPANY,

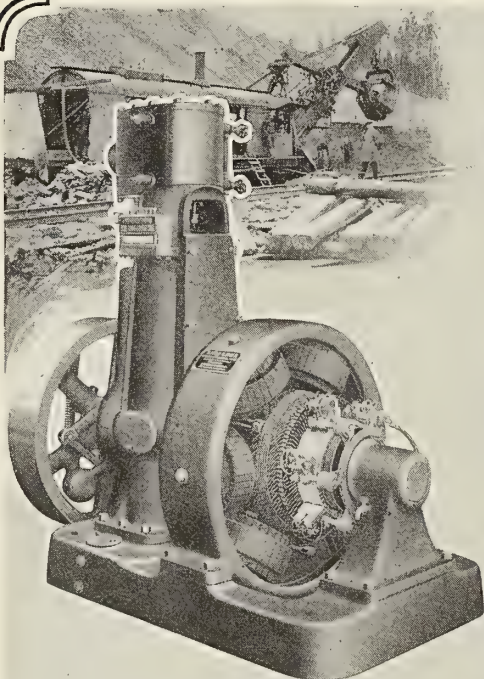
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84 Craig St. W., Montreal, Que.



GENERATING SETS

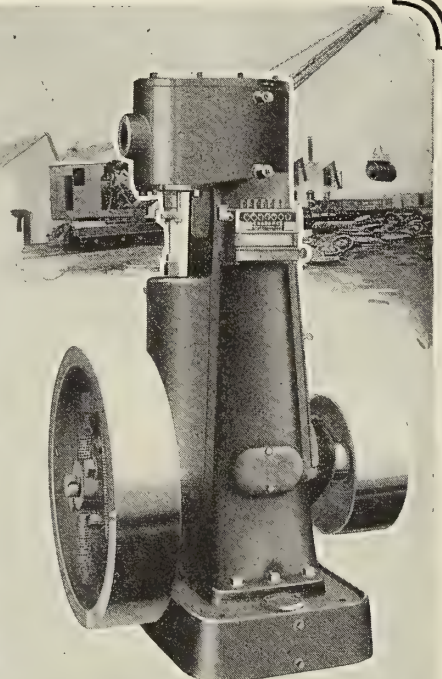
1 TO 50 K. W.

Described in Catalog 103



Engberg Generating Sets are most economical and dependable, making them especially satisfactory for all kinds of service where continuous and satisfactory operation is desired.

Engberg Engines are desirable for all power purposes. They combine every distinctive, discriminating and serviceable feature essential for proper performance.



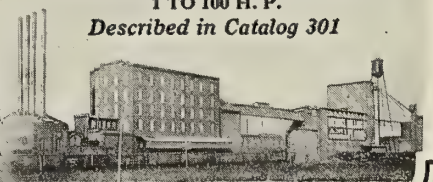
VERTICAL ENGINES

1 TO 100 H. P.

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ENGBERG'S ELECTRIC & MECHANICAL WORKS

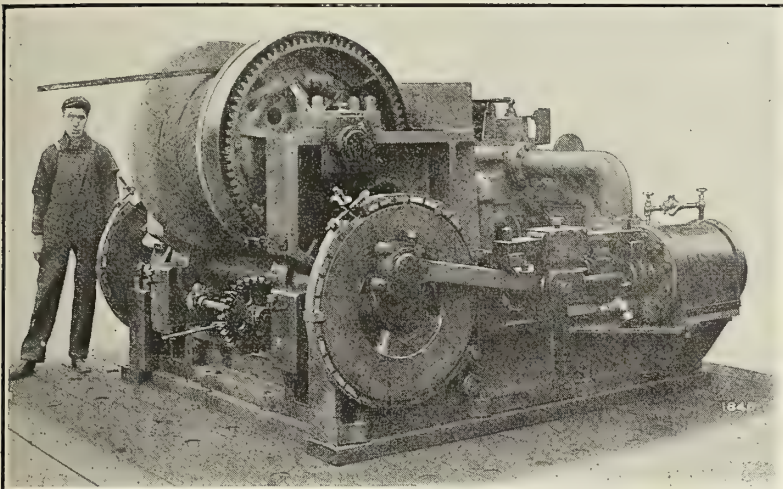
6 VINE ST., ST. JOSEPH, MICHIGAN, U.S.A.



LIDGERWOOD

TOWING ENGINES

are Jerk Proof



Because any material increase in hawser pull decreases the steam pressure in cylinders yields hawser and prevents JERKS.

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Therefore the hawser pull is steady, varies slightly, and small hawsers are used, offering slight resistance in dragging through seas.

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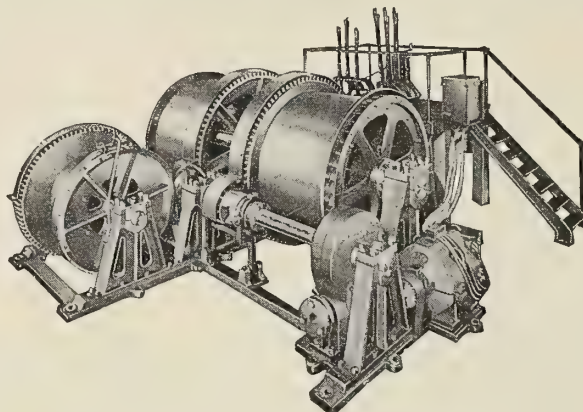
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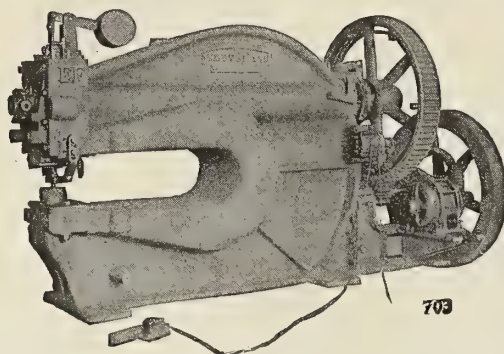
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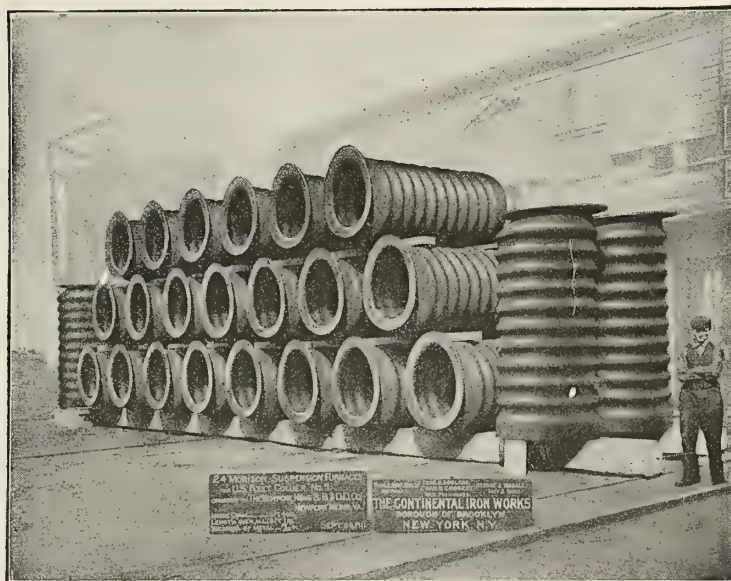
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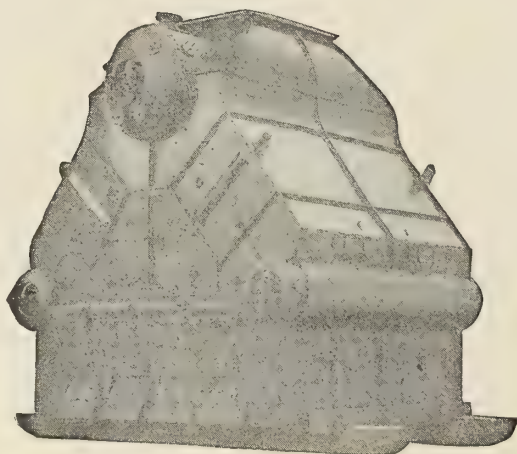
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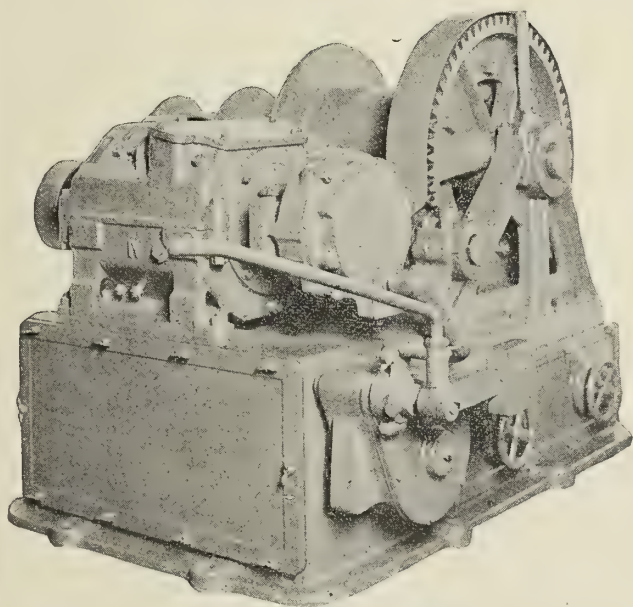
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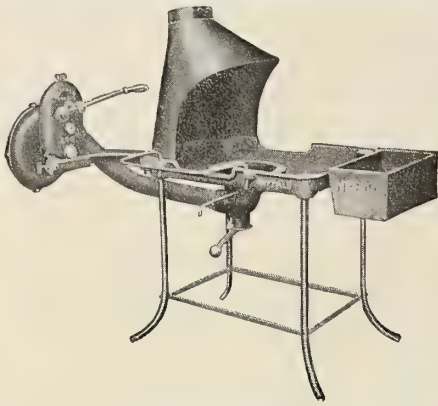
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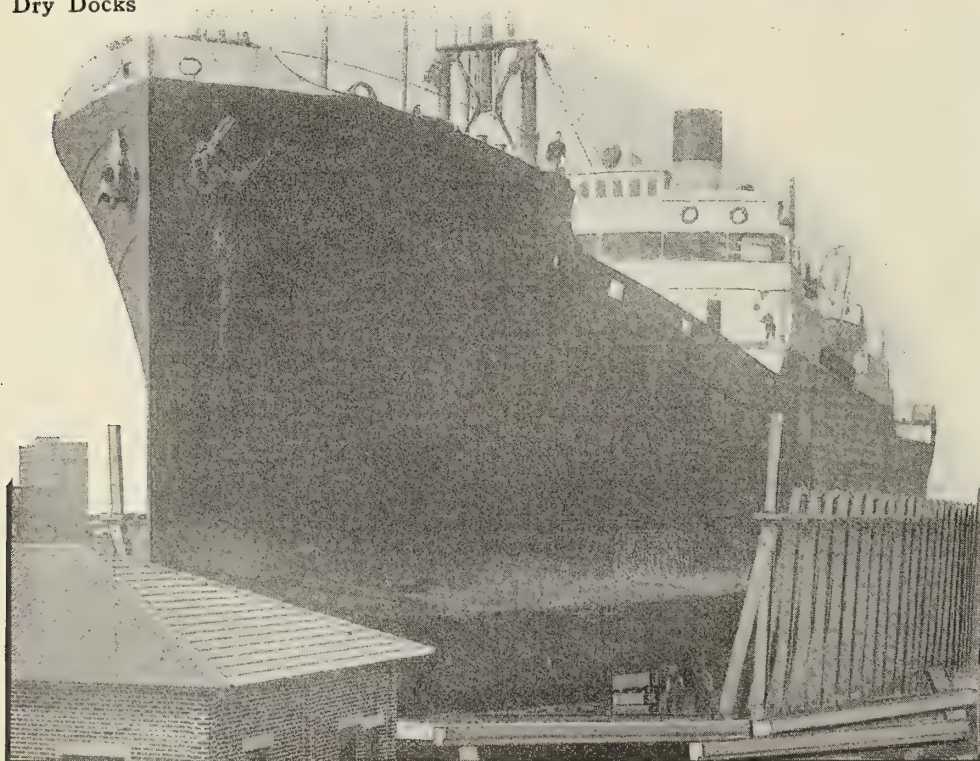
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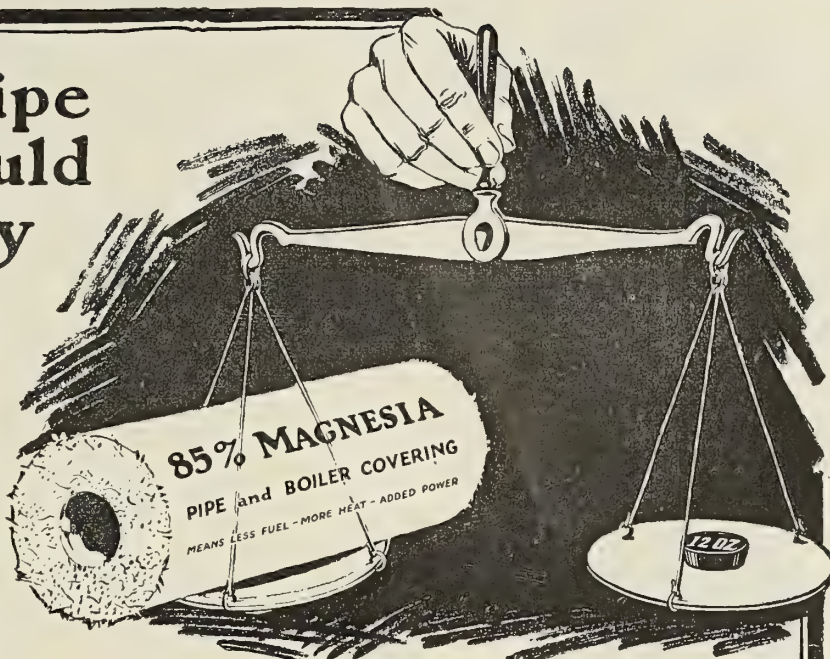
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NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

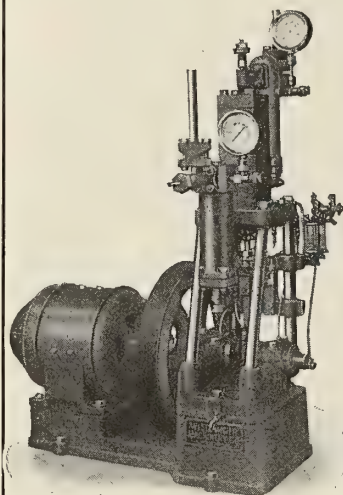
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Steamer Joseph Block of the
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Our comprehensive stock of uniform quality, quick deliveries and reasonable prices will commend us to you.

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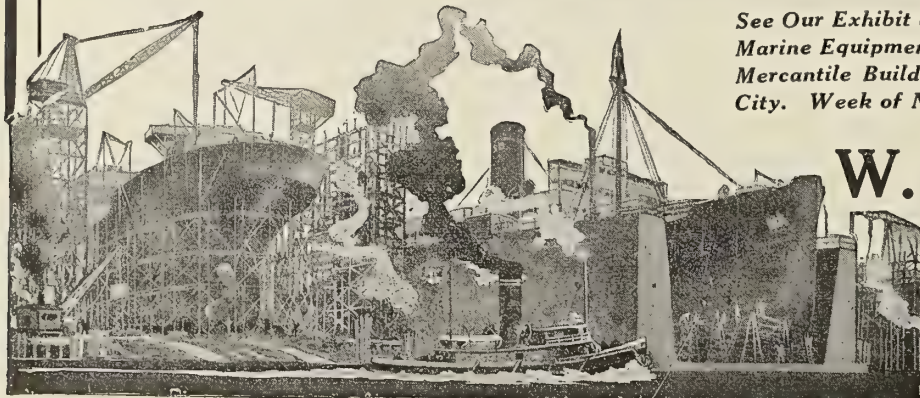
See Our Exhibit at the Annual Marine Exposition
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INTERNATIONAL MERCANTILE MARINE COMPANY

A. C. Fetterolf, Freight Traffic Manager

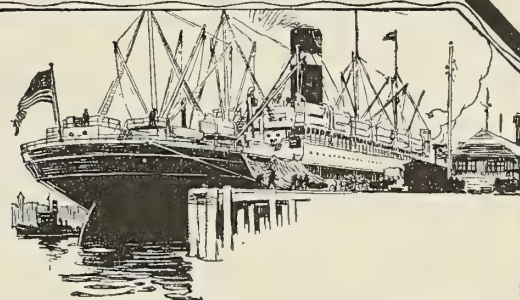
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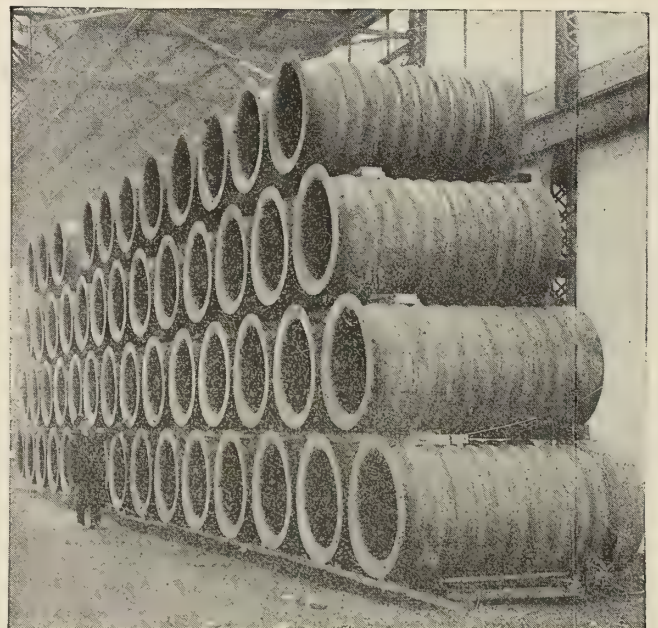
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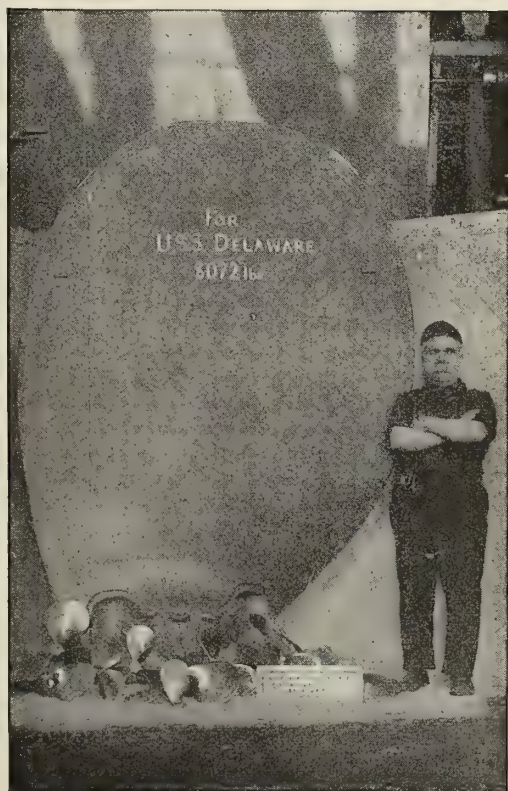
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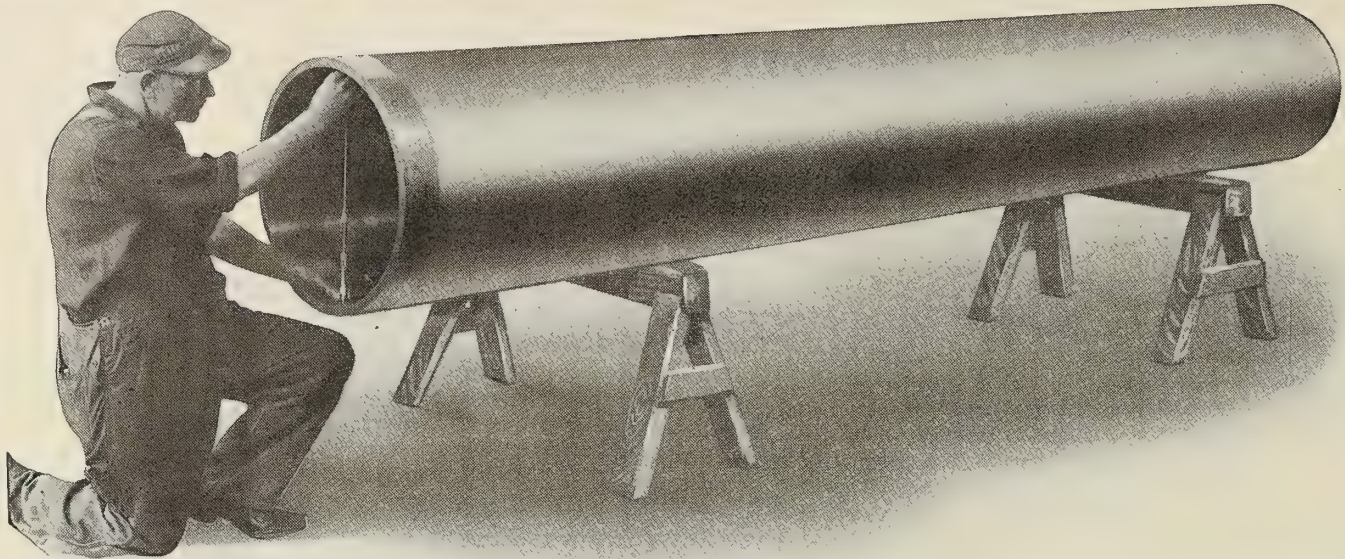
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READY FOR SHRINKING ON

NO PATTERNS REQUIRED

FURNISHED ON SHORT NOTICE

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NO SPLICING—NO JOINTING

LENGTHS UP TO 20 FEET

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The R & D PARACOIL EVAPORATOR

R & D Paracoil Evaporators and Distilling Condensers, are made for both single and multiple-effect plants in marine service.

Constructed with cast iron or steel plate shells, of all capacities up to 50 tons per 24 hours per unit.

Improved cleaning facilities make maintenance expense low.

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Feed Water Heaters, Feed Water Filters, Grease Extractors, Distillers, Ash Ejectors, Condensers, Fresh Water Still, Fuel Oil Heaters, Oil Coolers, R & D Gravity Flow Filters and Inspection Tanks, Rand System for Bunker Oil.

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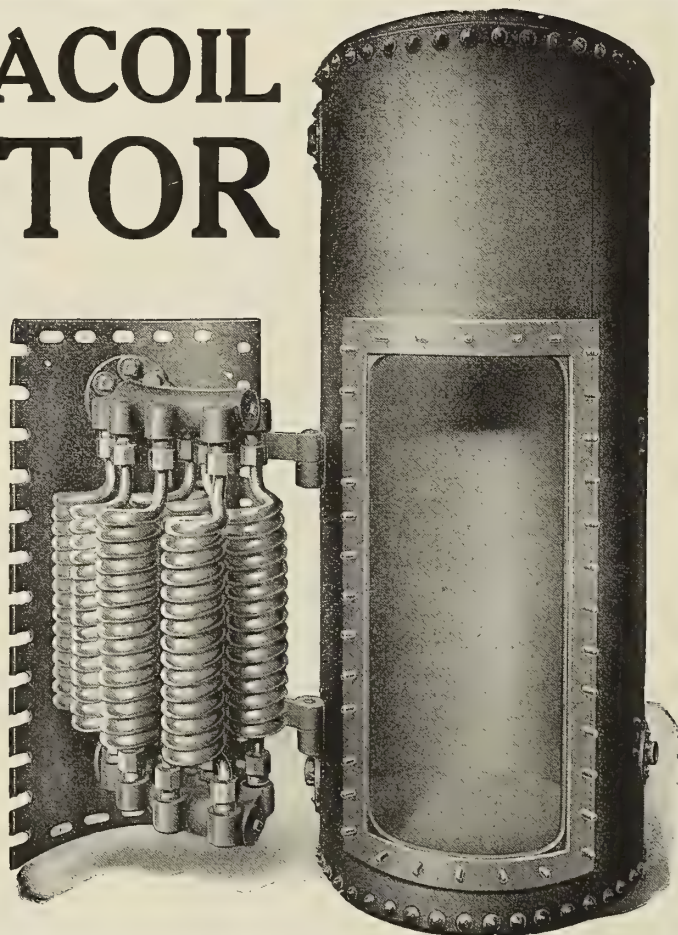
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"Warren" than to wish it was.

WARREN STEAM PUMP CO.

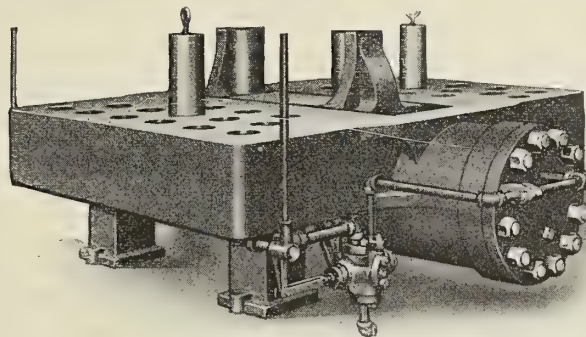
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We show here *just* one example from our large line of presses for Bending Pipe, Rods, Shafts, Angles, Beams and Structural Shapes, etc.



This machine works on water pressure of 1500 lbs. per square inch. The pins are interchangeable in any of the holes. The ram is double ended and is actuated by two cylinders, enabling the operator to exert force from either side of the table. The valves are placed in one body, and connecting levers at either side of the press govern the movements completely.

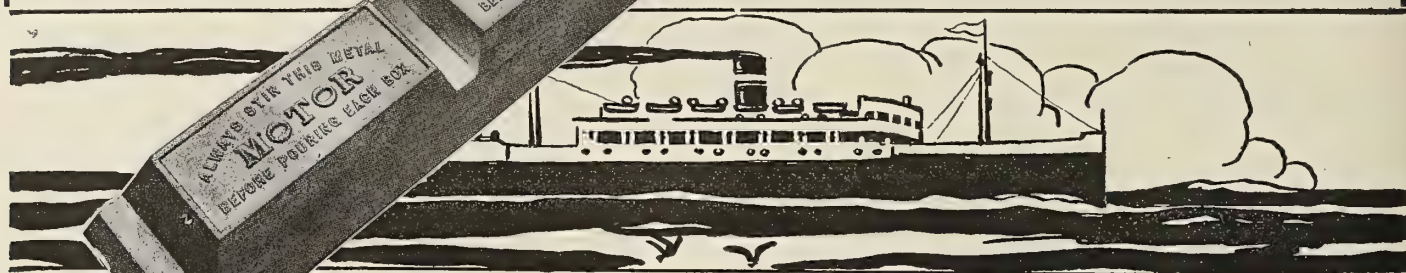
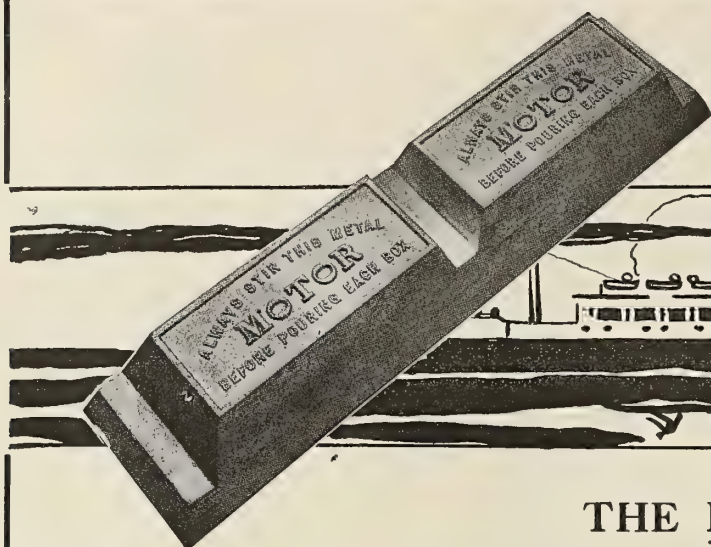
We build hydraulic presses for every purpose where hydraulic pressure is a possibility—also pumps, accumulators, valves, fittings, packings, shears, riveters, punches, jacks, etc.

THE WATSON-STILLMAN CO.

36 Church St., New York Chicago, McCormick Bldg.
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THE REAL BABBITT METAL

*We guarantee our
metals to be made
100% of virgin
raw materials
of the highest
grades at all times.*

for heavy pressure bearings, crank pins, slides and thrust bearings in all types of marine engines.

Standard in the largest shipyards.

Specified by leading naval architects and steamship owners for all bearings of Diesel type engines.

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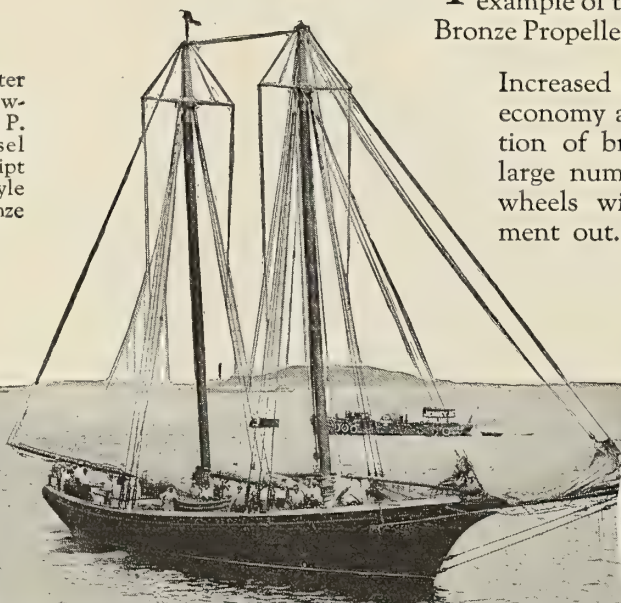
New York

Columbian Bronze Propellers

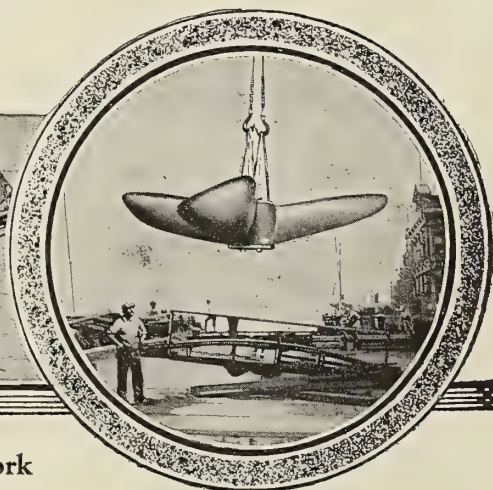
are the Most Economical and Efficient Propellers for Commercial Ships of All Kinds

THE Auxiliary Schooner "Pioneer" is a typical example of the type of ship for which Columbian Bronze Propellers are so well fitted.

"Pioneer" a Gloucester Auxiliary Schooner powered with a 70 B. H. P. Bolinders Semi-Diesel Oil Engine and equipped with a three blade Style "H" Columbian Bronze Propeller, 48"x30".



Increased speed, increased efficiency, increased economy are all made possible by the installation of bronze propellers. The increasingly large number of ships replacing their iron wheels with bronze wheels bears this statement out.



COLUMBIAN BRONZE CORPORATION, 522 Fifth Avenue, New York



Federal Marine Paints
are accepted everywhere as
the standard of marine
protection

TOPSIDE paints, boottopping, bottom paints, smokestack, deck and copper paints made by the Federal Composition & Paint Co., Inc., are, because of their high quality, acknowledged as standard by the ship owners all over the world.

They combine positive protection with ultimate economy. Paint once with Federal Paint and paint well. It will help keep your ship out of drydock, and cut superstructure work to a minimum.

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"Weather-best"

F-24

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"C-O" Marine Oil Engines



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"After completing a ten days' cruise on our pilot boat "VIRGINIA," in which we have two of your 75 H.P. 'C-O' engines, we are more than satisfied with our selection—the engines functioning perfectly at all times during the delicate manœuvring involved in boarding about three hundred vessels off the Virginia Capes and we can imagine no more severe test than this."

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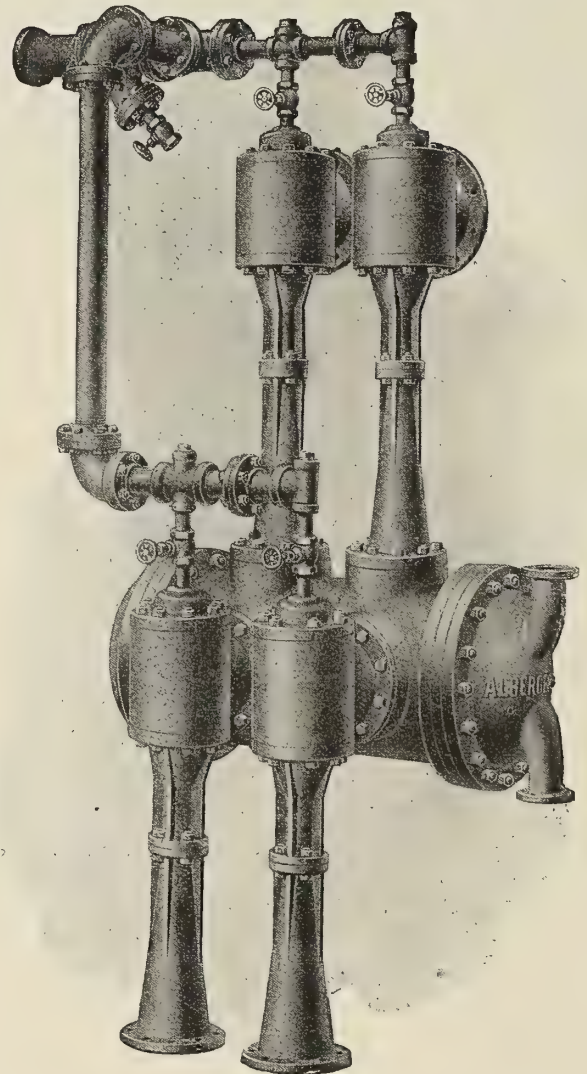
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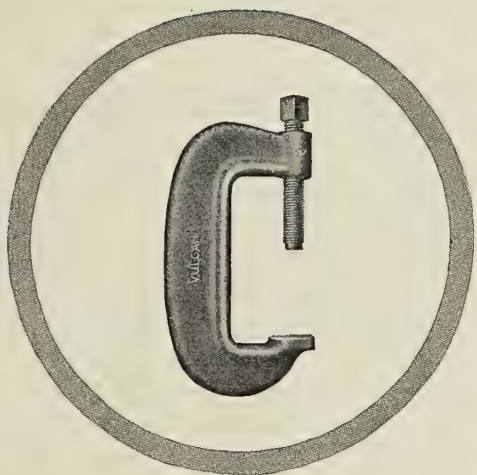
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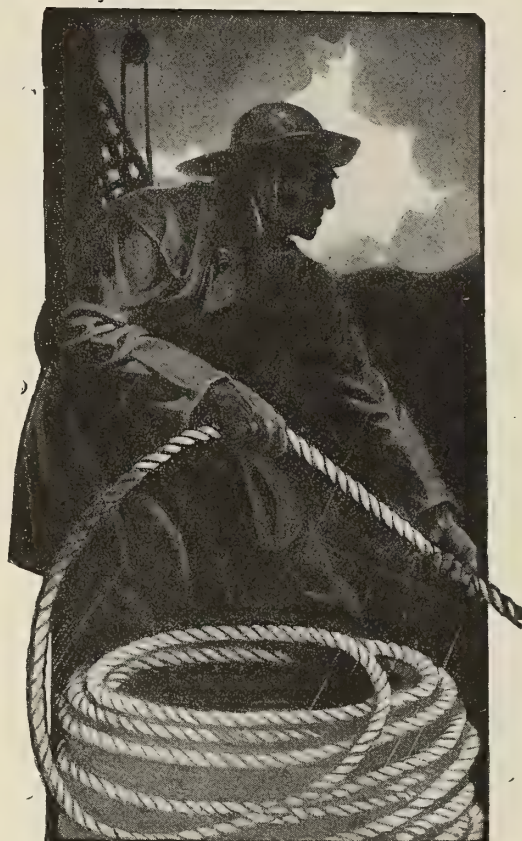
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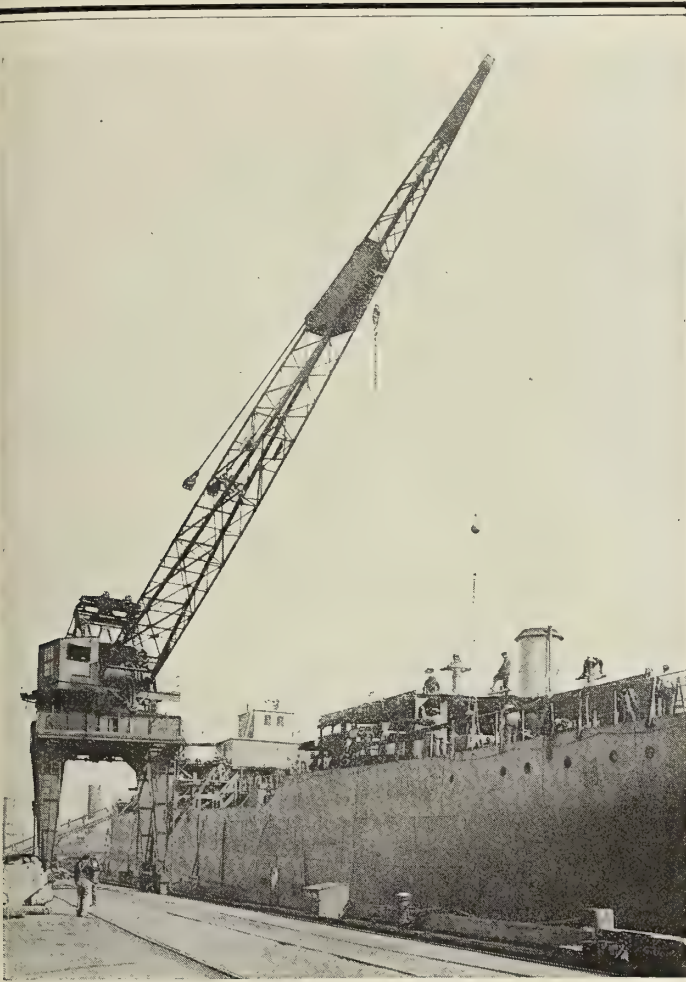
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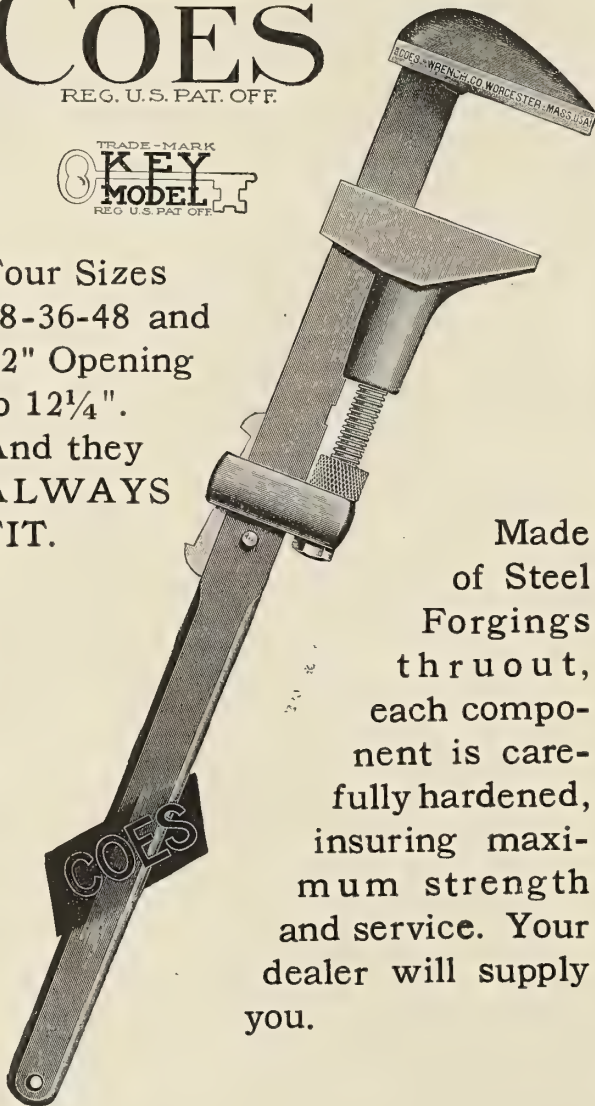
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STATEMENT of the ownership, management, circulation, etc., required by the act of Congress of August 24, 1912, of MARINE ENGINEERING AND SHIPPING AGE, published monthly at New York, N. Y., for October 1, 1921.

State of New York } ss.
County of New York }

Before me, a notary public in and for the State and county aforesaid, personally appeared Edward A. Simmons, who, having been duly sworn according to law, deposes and says that he is the President of the Aldrich Publishing Company, publisher of MARINE ENGINEERING AND SHIPPING AGE, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Aldrich Publishing Company, Woolworth Building, New York, N. Y.

Editor, F. B. Webster, Woolworth Building, New York, N. Y.

Managing Editor, H. H. Brown, Woolworth Building, New York, N. Y.

Business Managers, None.

2. That the owners are:

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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

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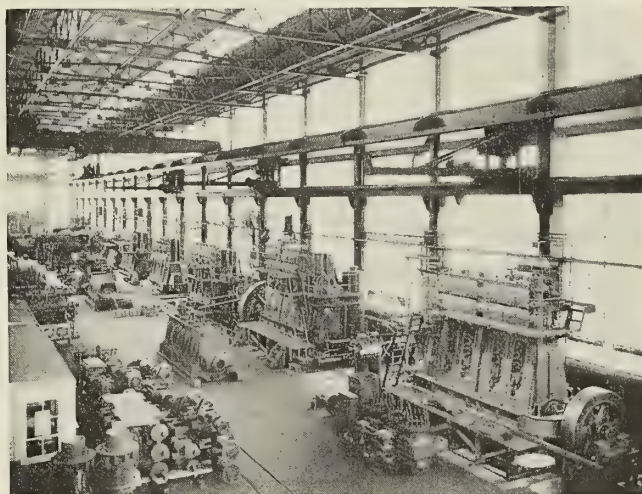
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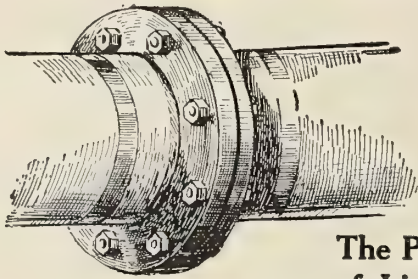


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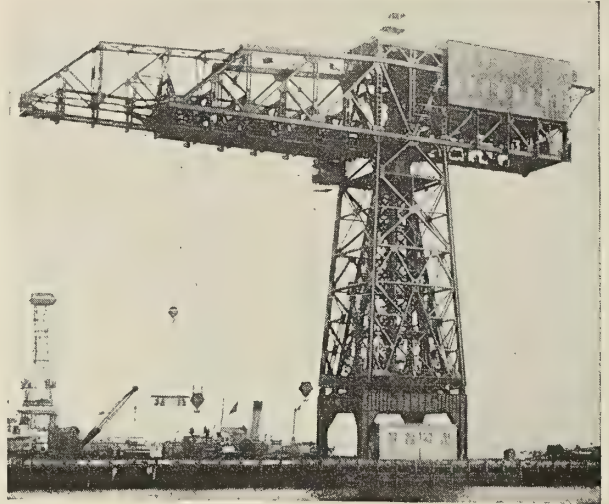
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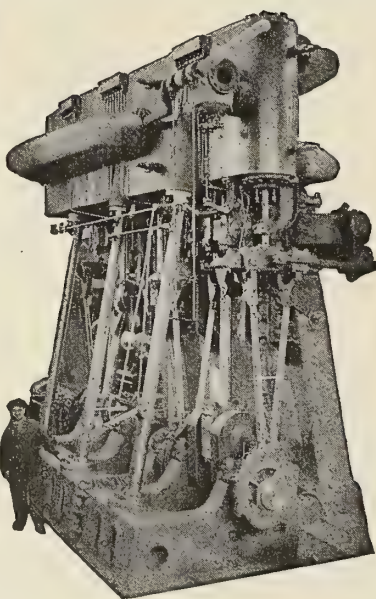
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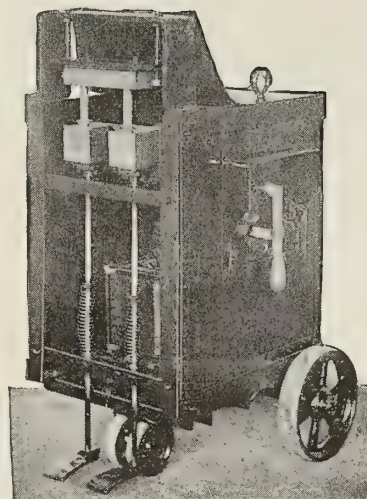
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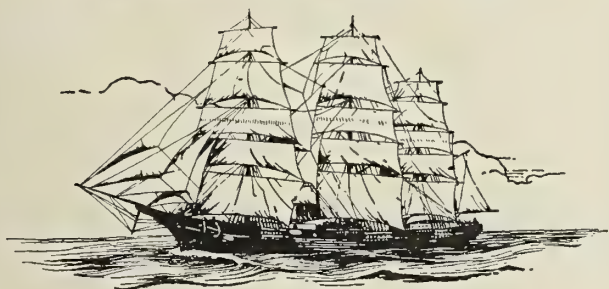
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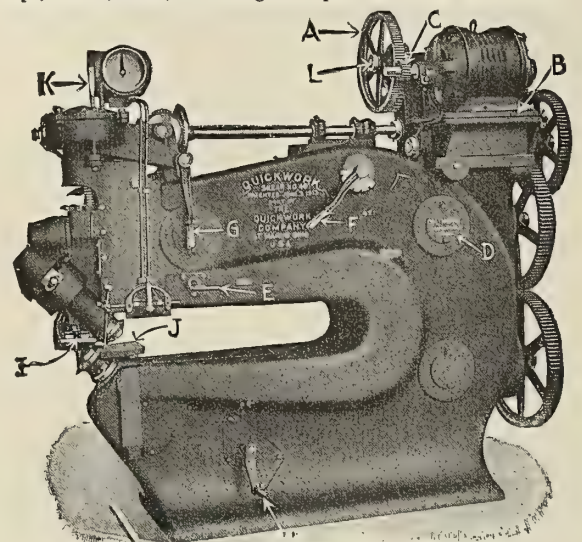
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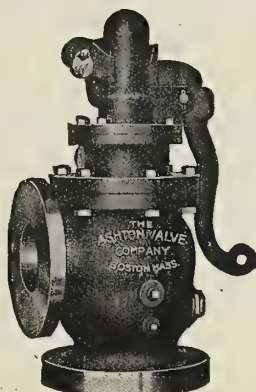
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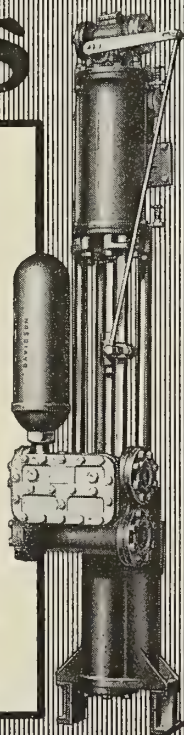
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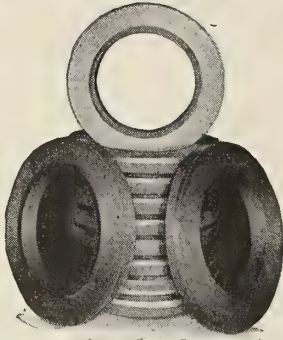
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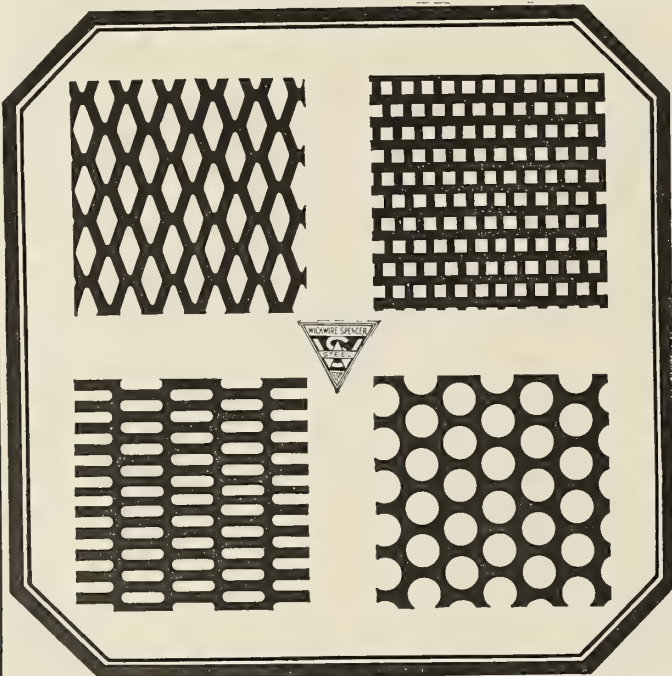
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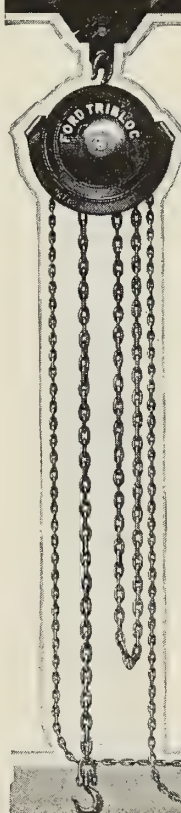
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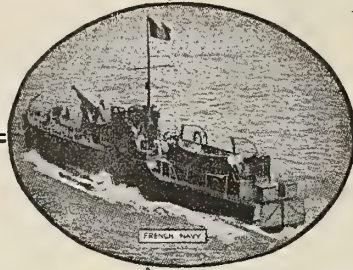
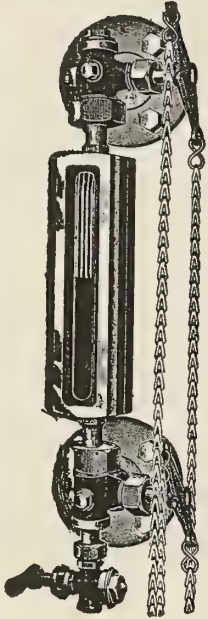
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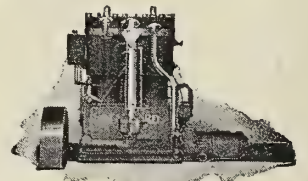


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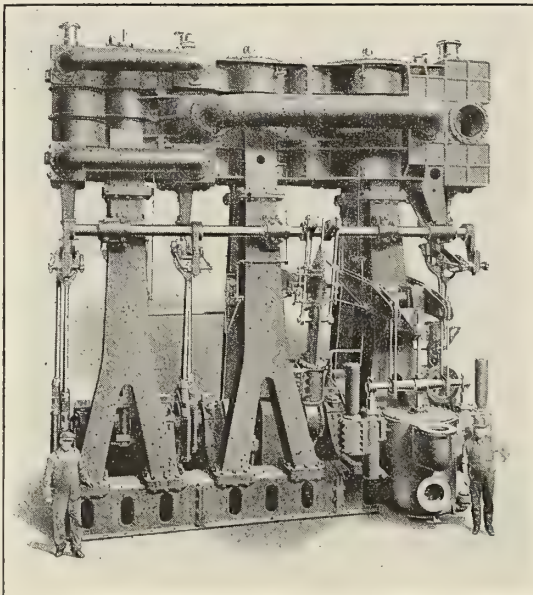
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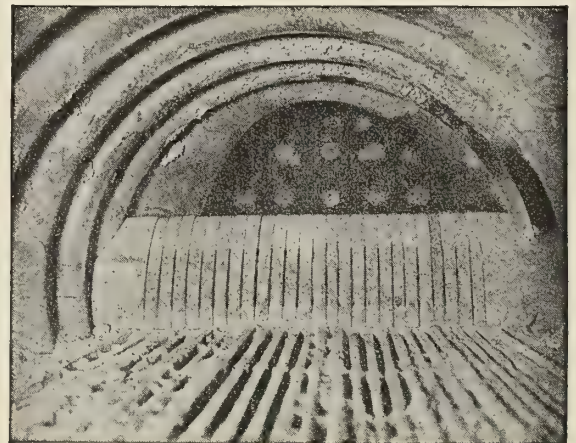
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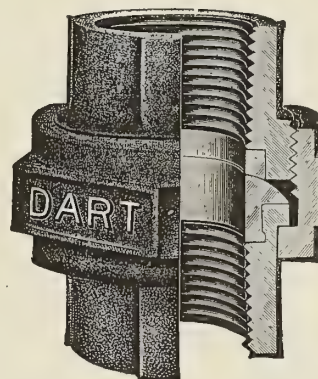
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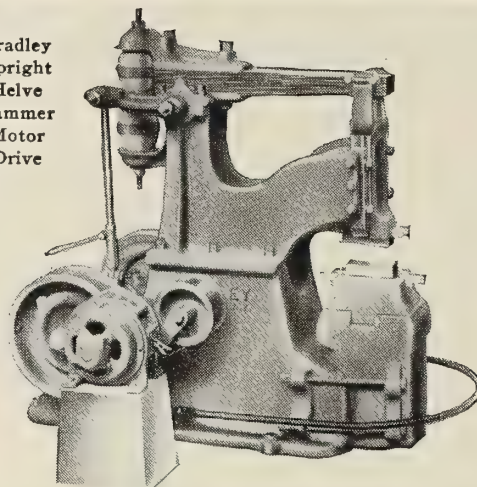
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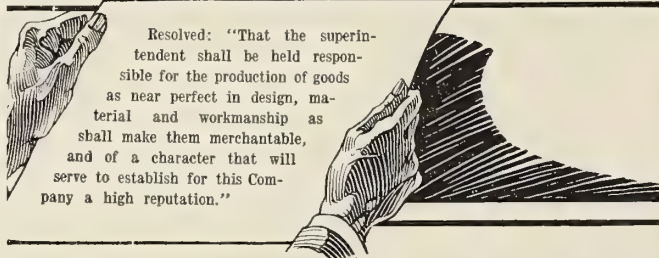
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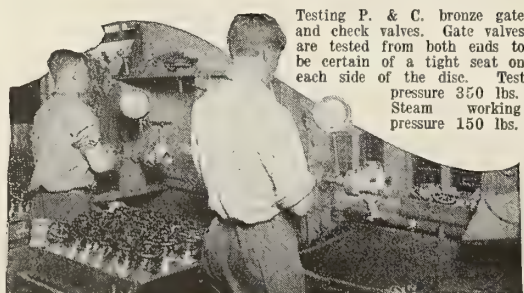
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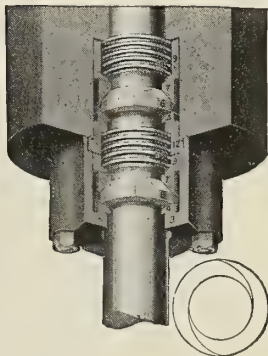
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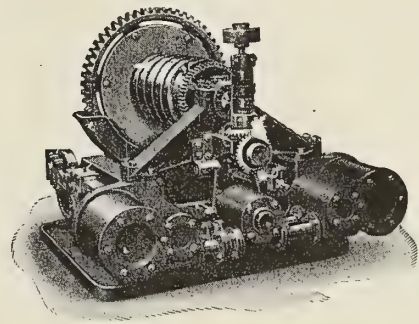


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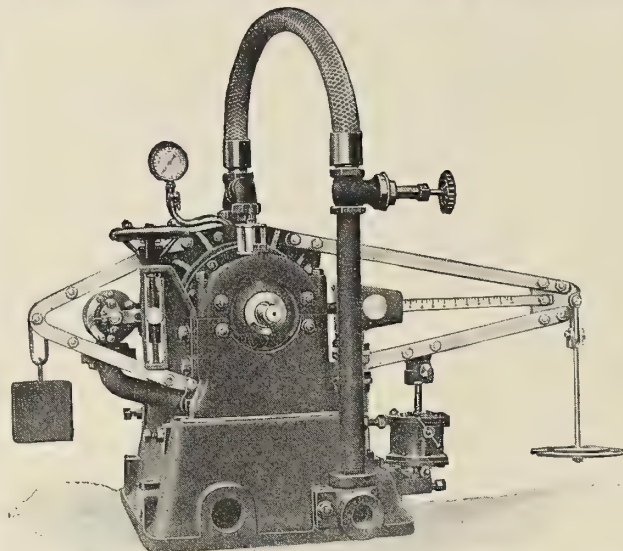
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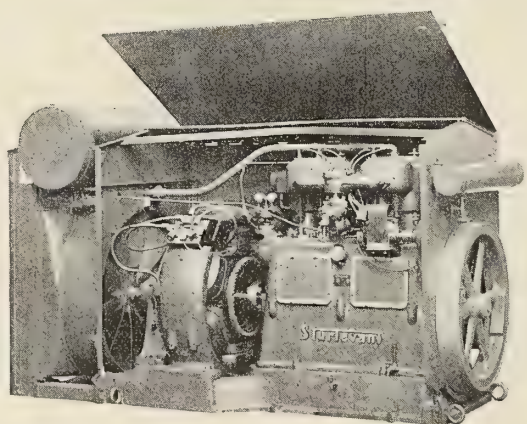
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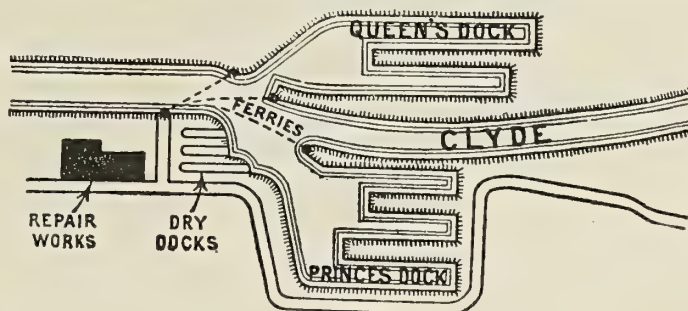
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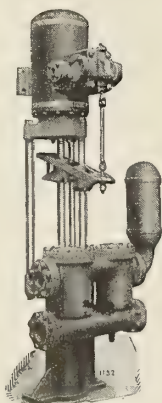
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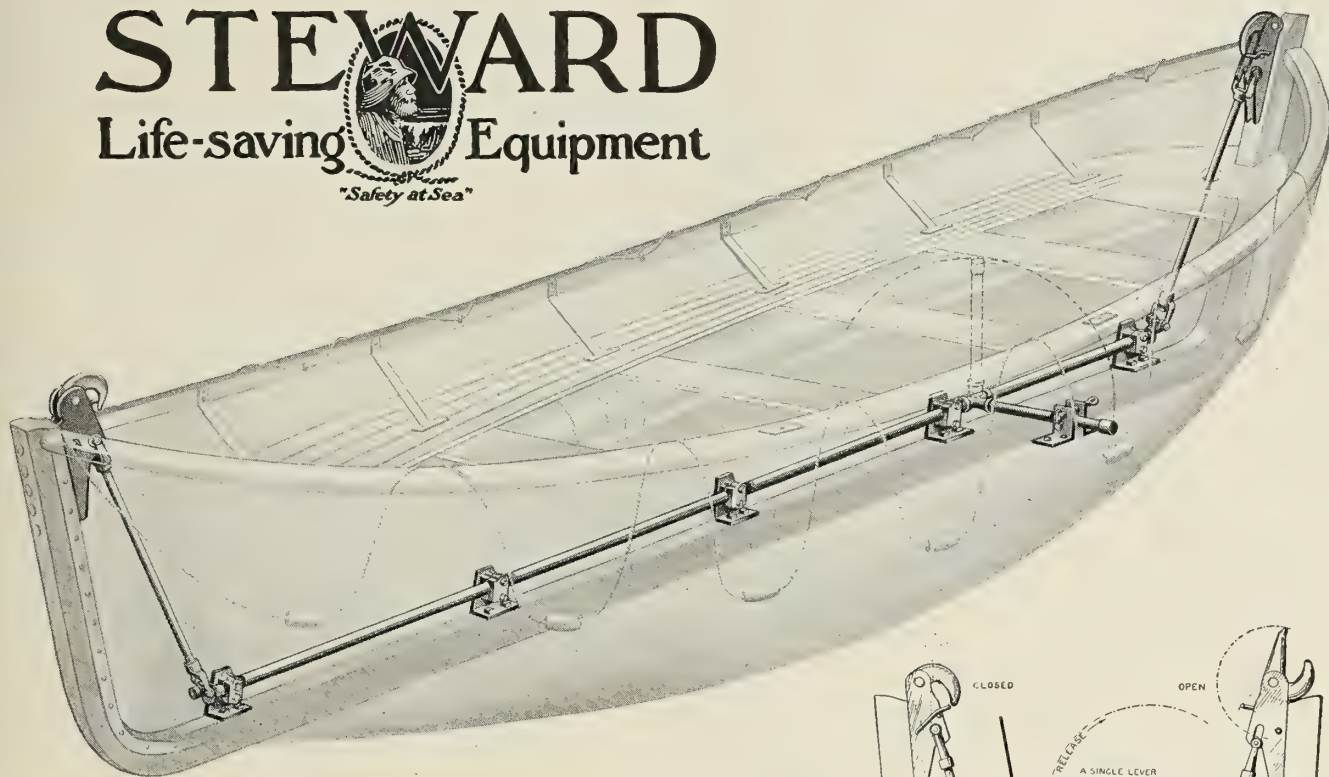
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Deck Fittings Steward Davit & Equip. Corp. Williams, Wm. E.	Drilling Machines Niles-Bement-Pond Co.	Electric Freight Trucks (See Freight-Handling)	Electric Fire Alarm Systems Aero Alarm Co.	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.
Deck Plates Sands & Son, A. B. Williams, Wm. E.	Drills Williams, Wm. E.	Electric Heaters General Electric Co.		

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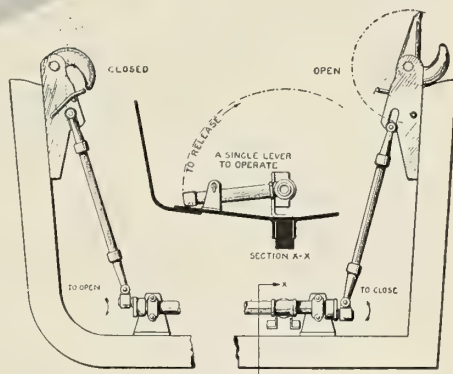
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Detail of Operation

READILY INSTALLED IN NEW OR OLD BOATS

To operate the Steward Boat Releasing Gear a single lever is thrown over, revolving the shaft and releasing in less than a half turn. There are no chains, wires or thin bars in tension or compression; accidental release is impossible.

The action is positive and can only be done with deliberation, but is so simple that in emergency any one can safely release a lifeboat full of people. The leverage is so powerful that very little effort is required even when the boat is not waterborne.

The falls may be instantly attached to the hooks without moving the lever and cannot drop out when slack; they may be disengaged just as readily if desired.

It has been the experience of practical seamen that the Steward Releasing Gear solves the problem of clearing away a boat in a seaway. No matter how high the sea you can release both ends instantly when the word is passed. One turn of the lever and the boat is afloat.

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Engine Room Telegraphs Horne Mfg. Co. Williams, Wm. E.	Flanges American Spiral Pipe Works Crane Co., The Lunkenheimer Co., The Williams, Wm. E.	Fuel Oil Burners White Fuel Oil Engineering Corp. Williams, Wm. E.	Gauge Cocks Jerguson Gage & Valve Co. Lunkenheimer Co., The Powell Co., The William Sands & Son Co., A. B. Williams, Wm. E.	Grinders—Electric and Pneumatic Chicago Pneumatic Tool Co.
Engrave Stem Thermometers Taylor Instrument Companies	Flanging Machines Niles-Bement-Pond Co. Watson-Stillman Co. Williams Co., J. H.	Fuel Oil Heaters Alberger Pump & Condenser Co. Griscom-Russell Co. Williams, Wm. E.	Gauge Glasses Crane Co., The Jerguson Gage & Valve Co. Lunkenheimer Co., The Powell Co., The William Williams, Wm. E.	Guillotine Shears Cleveland Punch & Shear Works Co. Niles-Bement-Pond Co.
Evaporators American Engineering Co. Davidson Co., M. T. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc. Williams, Wm. E.	Floating Cranes (Also see Cranes) McMyler-Interstate Co.	Fuel Oil Pumps Davidson Co., M. T. Warren Steam Pump Co.	Gyro Compasses. Sperry Gyroscope Co.	Gyro-Stabilizers. Sperry Gyroscope Co.
Exhaust Fans (See Blowers)	Float Valves Crane Co., The Lunkenheimer Co., The	Furnace Bridge Walls Ferguson-Herbert Corp'n Wager Furnace Bridge Wall Co., Inc.	Gauges (See Draft Gauges; also Tank Gauges)	Gypseys American Engineering Co. Hyde Windlass Co. Lidgerwood Mfg. Co. J. S. Mundy Hoisting Engine Co.
Expanders (See Boiler Flue Expanders and Pipe Expanding and Flanging Machines)	Floating Dry Docks (See Dry Docks)	Furnace Fronts Continental Iron Works, The	Gauges—Manufacturers' (Also see Steam Gauges)	Hammers Bradley & Son, C. C.
Expansion Joints Alberger Pump & Condenser Co. Crane Co., The Griscom-Russell Co. Lunkenheimer Co. Powell Co., The William	Floor Plates Crane Co., The	Furnaces (Also see Oil Furnaces) American Spiral Pipe Works Continental Iron Works, The Mahr Mfg. Co.	Gears De Laval Steam Turbine Co. Falk Corp., The Kerr Turbine Co. Westinghouse Electric & Mfg. Co.	Hammers, Pneumatic (See Pneumatic Tools)
Eye Bolts Williams & Co., J. H. Williams, Wm. E.	Flue Cleaners (See Boiler Flue Cleaners)	Fusible Plugs Crane Co., The Griscom-Russell Co. Lunkenheimer Co., the Williams, Wm. E.	General Welding and Cutting Equipment (See Welding & Cutting Apparatus and Supplies)	Hammers, Steam Niles-Bement-Pond Co.
Fans (See Blowers)	Flue Cutters (See Boiler Flue Cutters)	Fuses, Enclosed Cartridge. Chicago Fuse Mfg. Co.	Generating Sets Engberg's Electric & Mechanical Wks. Fairbanks-Morse Co. General Electric Co. Kerr Turbine Co. Lyle National Co. Westinghouse Electric & Mfg. Co. Williams, Wm. E.	Hammocks (See Couch Hammocks)
Feed Water Heaters Alberger Pump & Condenser Co. Griscom-Russell Co. Kearfott Engineering Co. Pratt & Cady Co., Inc. Row & Davis, Engineers, Inc. Williams, Wm. E.	Flue Hole Punches and Dies Cleveland Punch & Shear Works Co.	Galley Pumps Mott Iron Works, J. L. Sands & Son, Co., A. B. Williams, Wm. E.	Generators Engberg's Electric & Mechanical Wks. Fairbanks-Morse Co. General Electric Co. Pyle National Co. Williams, Wm. E.	Handles (Crank, Balance, Machine) Williams & Co., J. H.
Feed Water Regulators Jerguson Gage & Valve Co. Kearfott Engineering Co.	Fog Horns Williams, Wm. E.	Galleys (See Ranges)	Globe Valves—Brass and Iron Crane Co., The Lunkenheimer Co., The Powell Co., The William Pratt & Cady Co., Inc. Pyle National Co. Williams, Wm. E.	Hardware (See Marine Hardware)
Fences (See Wire Fences)	Forced Draft (See also Blowers) De Laval Steam Turbine Co. General Electric Co. Kearfott Engineering Co. Kerr Turbine Co. B. F. Sturtevant Co.	Galvanized Material Sands, A. B., & Son Co. Tiebout, W. & J. Williams, Wm. E.	Heat Insulation (Also see Non-Conducting Coverings) American Balsa Co. Magnesia Association of America	Heaters (Bath, Lavatory, Shower) Alberger Pump & Condenser Co. Griscom-Russell Co. Kearfott Engineering Co. Mott Iron Works, J. L. Pratt & Cady Co., The Sands & Son Co., A. B. B. F. Sturtevant Co. Williams, Wm. E.
Ferrules—Condenser Tube (See Condenser Tube Ferrules)	Forges C. C. Bradley & Son Buffalo Forge Co. Mahr Mfg. Co.	Gantry Cranes Niles-Bement-Pond Co.	Glue—Marine Williams, Wm. E.	Heating and Ventilating Equipment. B. F. Sturtevant Co.
Files Williams, Wm. E.	Forgings, Bronze Hyde Windlass Co. Pollak Steel Co.	Gas Compressors Norwalk Iron Works	Governors Cory, Chas., & Sons, Inc.	Hemp (See Twine)
Filters—Marine Oil Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc. Williams, Wm. E.	Forgings—Drop (See Drop Forgings)	Gas Engine Specialties Crane Co., The Lunkenheimer Co., The Powell Co., The William	Grate Bars Ferguson-Herbert Corp'n	Hoist Hooks Williams, J. H., & Co. Williams, Wm. E.
Fire Alarm Systems Aero Alarm Co. Horne Mfg. Co. Kidde Co., Inc., Walter	Forgings, Iron and Steel (Also see Drop Forgings) Charleston Dry Dock & Machine Co. Pollak Steel Co.	Gaskets (Also see Packing) Crane Co., The Goetze Gasket & Packing Co. Griscom-Russell Co. Smooth-On Mfg. Co. Williams, Wm. E.	Grease (See Lubricants)	Hoisting Engines Allan-Cunningham Co. American Engineering Co. Fairbanks-Morse Co. Flory Manufacturing Co., S.
Fire Department Supplies Kidde Co., Inc., Walter	Freight-Handling Equipment Brown Hoisting Machinery Co. General Electric Co. Lidgerwood Mfg. Co. McMyler Interstate Co. J. S. Mundy Hoisting Engine Co. Shepard Electric Crane & Hoist Co.	Gasoline Engines Consolidated Shipbuilding Corp. Fairbanks-Morse Co. Standard Motor Construction Co. B. F. Sturtevant Co. Winton Engine Co.	Grease Cups Crane Co., The Lunkenheimer Co., The Powell Co., The William Sun Co.	Hyde Windlass Co. Lidgerwood Mfg. Co. J. S. Mundy Hoisting Engine Co.
Fire Extinguishers Kidde Co., Inc., Walter Williams, Wm. E.	Fuel Economizer Griscom-Russell Co. Magnesia Association of America	Gate Valves — Brass and Iron Powell Co., The William Crane Co., The Lunkenheimer Co., The Pratt & Cady, Inc. Williams, Wm. E.		



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Tacoma *San Francisco
*Seattle *San Pedro
*Point Wells *San Diego
Astoria *Honolulu
*Richmond

CANADA

*Halifax *Vancouver
*Montreal Prince Rupert
*Levis (Quebec)

MEXICO

Tampico

PANAMA CANAL

Cristobal *Balboa

WEST INDIES

Havana Bermuda
Cienfuegos Curacao
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TURKEY

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JAPAN

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Arrangements will shortly be completed to cover ports in addition to those listed, as follows:

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Hamilton, Ont.
Sarnia, Ont.
Quebec (P. Q.)
St. John, N. B.
Victoria, B. C.
Antilla, Cuba
Matanzas, Cuba
Antofagasta, Chile
Iquique, Chile

Pisagua, Chile
Tocopilla, Chile
Taltal, Chile
Paíta, Peru
Callao, Peru
Bahia Blanca, Arg.
Ponta Delgada, Azores
Trondhjem, Norway
Bergen, Norway
Christiania, Norway
Vallo, Norway

Gothenburg, Sweden
Helsingfors, Finland
Aalborg, Denmark
Copenhagen, Denmark
Nyborg, Denmark
Avonmouth, U. K.
Birkenhead, U. K.
Cardiff, U. K.
Rotterdam, Holland
Amsterdam, Holland
Antwerp, Belgium

Rouen, France
Havre, France
Marseilles, France
Dunkirk, France
La Pallice, France
Genoa, Italy
Monopoli, Italy
Portici, Italy
Savona, Italy
Venice, Italy

Salonica, Greece
Bourgas, Bulgaria
Smyrna, Turkey
Port Said, Egypt
Alexandria, Egypt
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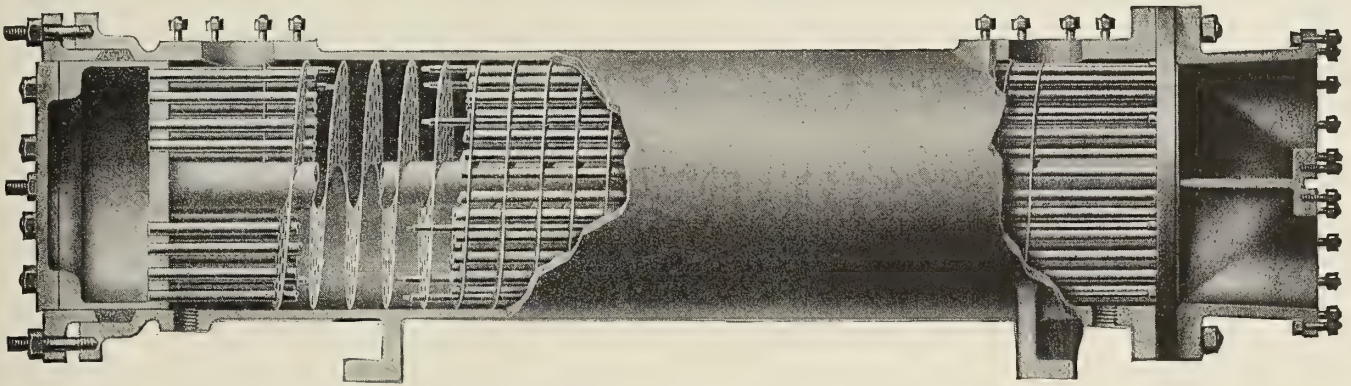
Hoisting and Transmission Rope (See Rope)	Interlocking Rubber Tiling Griscom-Russell Co.	Lights, Electric (See Electric Lights)	Marine Engineers (See Engineers, Consulting)	Mica Top Fuse Plugs Chicago Fuse Mfg. Co.
Hoists, Chain (See Chain Hoists)	Iron Cement, Smooth-on Mfg. Co.	Lines—Towing, Buoy (See Rope)	Marine Forgings (See Forgings)	Milling Machines Niles-Bement-Pond Co.
Hoists, Electric (See Electric Hoists)	Iron Pipe (See Pipe)	Loading and Unloading Equipment (See Freight-Handling Equipment)	Marine Glue Williams, Wm. E.	Mineral Wool (See Non-Conducting Covering)
Holders-On Chicago Pneumatic Tool Co. Ingersoll-Rand Co.	Iron Rust Remover The Rust Products Co.	Locks and Latches (See Ship Locks and Latches)	Marine Hardware Rostand Mfg. Co. Sands & Son Co., A. B. Tiebout, W. & J. Williams, Wm. E.	Mooring Engines American Engineering Co. Flory Mfg. Co., E. Hyde Windlass Co. Lidgerwood Mfg. Co.
Hollow Boring Pollak Steel Co.	Jacks (Pneumatic) Gracey, R., & Sons Co. Watson-Stillman Co.	Locomotive Cranes (See Cranes)	Marine Heaters (See Heaters)	Motor Boats (See Launches and Yachts)
Horizontal Punches Cleveland Punch & Shear Works Co.	Jacks, Hydraulic Watson-Stillman Co.	Log Registers American Balsa Co. Steward Davit & Equip. Corp.	Marine Lighting Sets (See Electric Plants) Williams, Wm. E.	Motor Boat Supplies Tiebout, W. & J. Williams, Wm. E.
Hose (Also see Air Hose) Chicago Pneumatic Tool Co. Ingersoll-Rand Co. U. S. Rubber Co.	Jacks—Steamboat Ratchet (Pulling) Gracey, R., & Sons Co. Griscom-Russell Co.	Lowering Control American Balsa Co.	Marine Paint (Also see Paint) Briggs Bituminous Composition Co., Inc. Federal Composition & Paint Co., Inc. Wadsworth, Howland & Co. Willes Dove - Hermiston Corp. Williams, Wm. E.	Motors, Electric General Electric Co.
Hose Coupling Chicago Pneumatic Tool Co. Cleveland Pneumatic Tool Co. Ingersoll-Rand Co. U. S. Rubber Co.	Journal Bearings (See Thrust Bearings)	Lubricants Standard Oil Co. (New Jersey) Sun Co. Wadsworth, Howland & Co.	Marine Plumbing Crane Co., The Mott Iron Works, J. L. Sands & Son Co., A. B.	Motors, Gasoline (See Gasoline Engines)
Humidifiers Griscom-Russell Co.	Kerosene Engines Consolidated Shipbuilding Corp. Fairbanks-Morse Co. Standard Motor Construction Co.	Lubricating Oil Pumps Warren Steam Pump Co.	Marine Railway Builders Crandall Engineering Co.	Multiple Drills Niles-Bement-Pond Co.
Hydraulic Fittings Crane Co., The Lunkenheimer Co. Powell Co., The William Watson-Stillman Co.	Ladder Treads Williams, Wm. E.	Lubricators Crane Co. Griscom-Russell Co. Lunkenheimer Co. Powell Co., The William Sun Co.	Marine Railways (See Dry Docks)	Multiple Punches Cleveland Punch & Shear Works Niles-Bement-Pond Co.
Hydraulic Presses and Other Machinery Niles-Bement-Pond Co. Warren Steam Pump Co. Watson-Stillman Co.	Ladle Heaters. Mahr Mfg. Co.	Machine Tools Cleveland Pneumatic Tool Co. Cleveland Punch & Shear Works Co. Niles-Bement-Pond Co.	Marine Ranges (See Ranges)	Multiwhirl Oil Coolers Griscom-Russell Co.
Hydrometers Taylor Instrument Companies	Lamps, Signals and Fixtures General Electric Co. Sands, A. B. & Son Co. Westinghouse Electric & Mfg. Co. Williams, Wm. E.	Machinists' Tools Williams & Co., J. H.	Marine Refrigeration (See Refrigerating Machinery)	Nautical Instruments McNab Co., The Sperry Gyroscope Co. Williams, Wm. E.
Hygrodecks Taylor Instrument Companies	Lathe Dogs Williams & Co., J. H. Williams, Wm. E.	Manganese Bronze Castings American Manganese Bronze Co. Columbian Bronze Corp. Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co. Powell Co., The William	Marine Repairs (See Shipbuilders)	Naval Architects Bogert, John L. Cathcart, Wm. L. Chapman & Fisher Cox & Stevens Donnelly, William T. Ferris, Theodore Jacobs Co., J. L. Haag, A. H. Haight, Robert S. Harris, Leonard B. McClelland, N. E., & Co., Ltd. McKinlay, James Matthews, John B. Nilson, Leonard J. Peerless Eng. Co. Rimmer, A. C. Russell & Thayer Sharp, Geo. G. Tams, Lemoine & Crane Watts, J. Murray Whittelsey & Whittelsey C. V. S. Wyckoff
Hygrometers Taylor Instrument Companies	Lathes, Crank Shaft, Engine and Turret Niles-Bement-Pond Co.	Magnesia Goods and Materials Magnesia Association of America	Marine Securities Marine Corporation	Needle Valves (See Valves)
Ice Machines (See Refrigerating Machinery)	Launches and Yachts (See shipbuilders)	Malleable and Steel Castings Crane Co.	Marine Shafting (See Shafting)	Nipples Crane Co., The Lunkenheimer Co., The
Indicator Connections Lunkenheimer Co. Powell Co., The William	Launching Grease Sun Co.	Manila and Sisal Rope (See Rope)	Marine Specialties (See Steam Specialties)	Non-Conducting Coverings Magnesia Association of America Thorsen, P. S., & Co., Inc.
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	Lead Pencils (See Drawing Pencils)	Marine Boiler Heads (See Boiler Heads)	Marine Wiring Devices General Electric Co.	Nuts (See Bolts and Nuts) Russell, Burdall & Ward Bolt and Nut Co. Williams, Wm. E.
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	Life Boats and Rafts American Balsa Co. Lane Lifeboat Co., C. M. Steward Davit & Equip. Corp. Williams, Wm. E.	Marine Decking (See Decking)	Mechanical Telegraphs Horne Mfg. Co. Radio Corporation of America Williams, Wm. E.	
	Life Preservers American Balsa Co. Williams, Wm. E.	Marine Electrical Equipment (See Electrical Fittings and Supplies)	Metallic Packing (Also see Packing) Goetze Gasket & Packing Co. U. S. Metallic Packing Co.	
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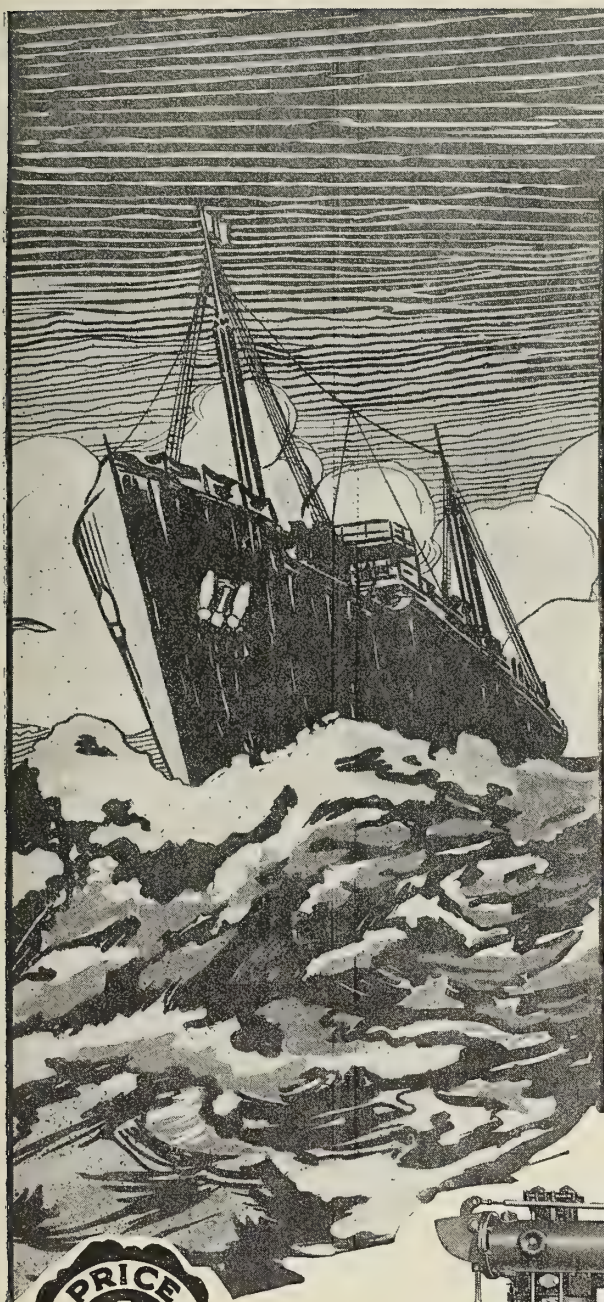
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Oil Coolers Alberger Pump & Condenser Co. Griscom-Russell Co.	Partitions (Marine Fireproof) Marine Decking & Supply Co.	Plugs and Receptacles— Watertight Williams, Wm. E.		Radial Drills Cleveland Punch & Shear Works Co. Niles-Bement-Pond Co.
Oil Cups Crane Co. Griscom-Russell Co. Lunkenheimer Co., The Powell Co., The William Sun Co. Williams, Wm. E.	Patents, Boat Design. Hullin Boat Co.	Plumbago (Also see Graphite) Williams, Wm. E.		Radio Apparatus Radio Corporation of America.
Oil Engines (See Engines, Oil)	Pencils (See Drawing Pencils)	Plumbers' Tools Williams & Co., J. H. Williams, Wm. E.		Rafts (See Lifeboats and Rafts)
Oil Fuel Standard Oil Co. (New Jersey) Sun Co.	Phosphor Bronze Castings American Manganese Bronze Co. Columbian Bronze Corp. Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co., The	Plumbing (See Marine Plumbing)		Railway Dry Docks Crandall Engineering Co.
Oil Fuel Apparatus (See Oil-Burning Equip- ment)	Pile Drivers Flory, S., Mfg. Co. Lidgerwood Mfg. Co. McMyler-Interstate Co. J. S. Mundy Hoisting En- gine Co.	Pneumatic Drills (See Pneumatic Tools)		Ranges Sands, A. B. & Sons Co.
Oil Gauges Crane Co. Lunkenheimer Co., The Powell Co., The William Williams, Wm. E.	Pipe National Tube Co. Watson-Stillman Co. Williams, Wm. E.	Pneumatic Hammers (See Pneumatic Tools)		Ratchet Jacks (Pulling and Pushing) Gracey & Sons Co., R.
Oil Heaters and Coolers Alberger Pump & Condenser Co. Griscom-Russell Co. Row & Davis, Engineers, Inc.	Pipe Bending Machines Buffalo Forge Co. Watson-Stillman Co.	Pneumatic Hose (See Air Hose) Sands, A. B., & Son, Co.		Reamers Brubaker & Bros., W. L. Chicago Pneumatic Tool Co.
Oil Pumps Davidson, M. T., Co. Ingersoll-Rand Co. Lunkenheimer Co., The Powell Co., The William National Transit Pump & Machine Co. Sands, A. B., & Son, Co. Warren Steam Pump Wks.	Pipe Covering (See Non-Conducting Cov- ering)	Pneumatic Riveters Ingersoll-Rand Co. Watson-Stillman Co.		Reclaiming Systems For Oil De Laval Separator Co.
Oil Purifiers De Laval Separator Co. Griscom-Russell Co.	Pipe Cutting and Threading Machine Niles-Bement-Pond Co. Williams, Wm. E.	Pneumatic Separators Griscom-Russell Co.		Recording Instruments (Also see Steam Gauges) Taylor Instrument Com- panies
Oil Tankers (See Tank Ships)	Pipe Expanding and Flanging Machines Watson-Stillman Co.	Pneumatic Tools Cleveland Pneumatic Tool Co. Chicago Pneumatic Tool Co. Ingersoll-Rand Co.		Reducing Gears (See Gears)
Oiling Systems (Also see Lubricants) Lunkenheimer Co., The Powell Co., The William	Pipe Flanges (See Flanges)	Pop Safety Valves Ashton Valve Co. Crane Co. Lunkenheimer Co., The Powell Co., The William Williams, Wm. E.		Reducing Valves Crane Co. Lunkenheimer Co., The Williams, Wm. E.
Open Link Fuses—All Types Chicago Fuse Mfg. Co.	Pipe Unions Crane Co. Lunkenheimer Co., The Powell Co., The William Williams, Wm. E.	Portable Drills General Electric Co.		Reflex Water Gauges Jerguson Gage & Valve Co.
Ore-Handling Machinery (See Coal-Handling Ma- chinery)	Pipe Wrenches Williams & Co., J. H. Williams, Wm. E.	Portable Elevators (For Handling Bulk Ma- terials)		Refrigerating Machinery Brunswick Refrigerating Co. Frick Co. Norwalk Iron Works Westinghouse Electric & Mfg. Co. Wittenmeir Machinery Co. York Mfg. Co.
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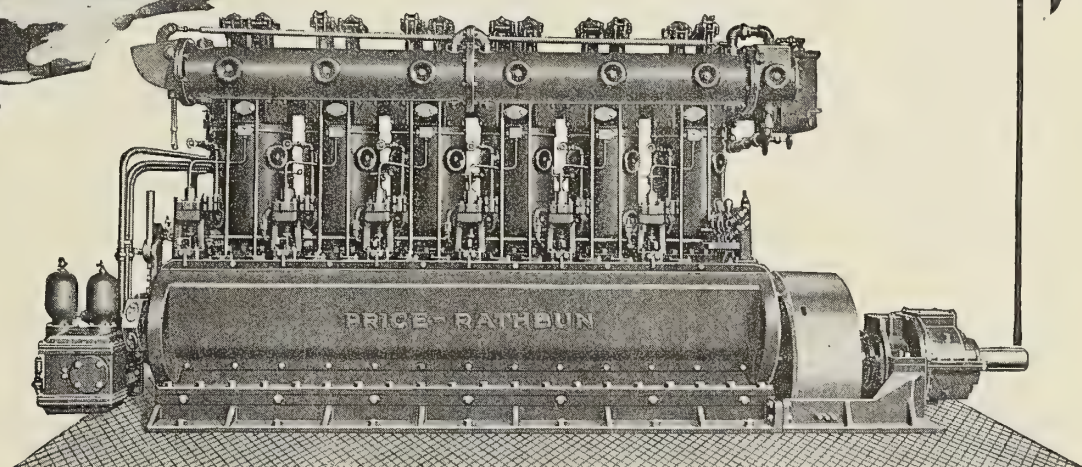
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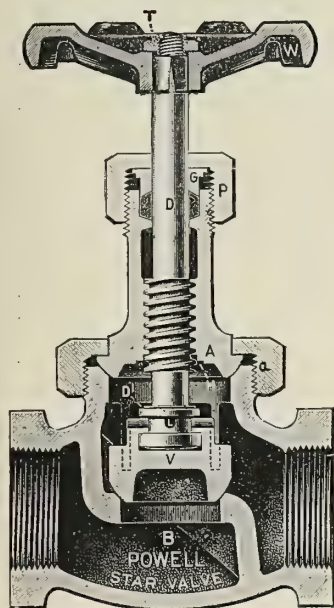
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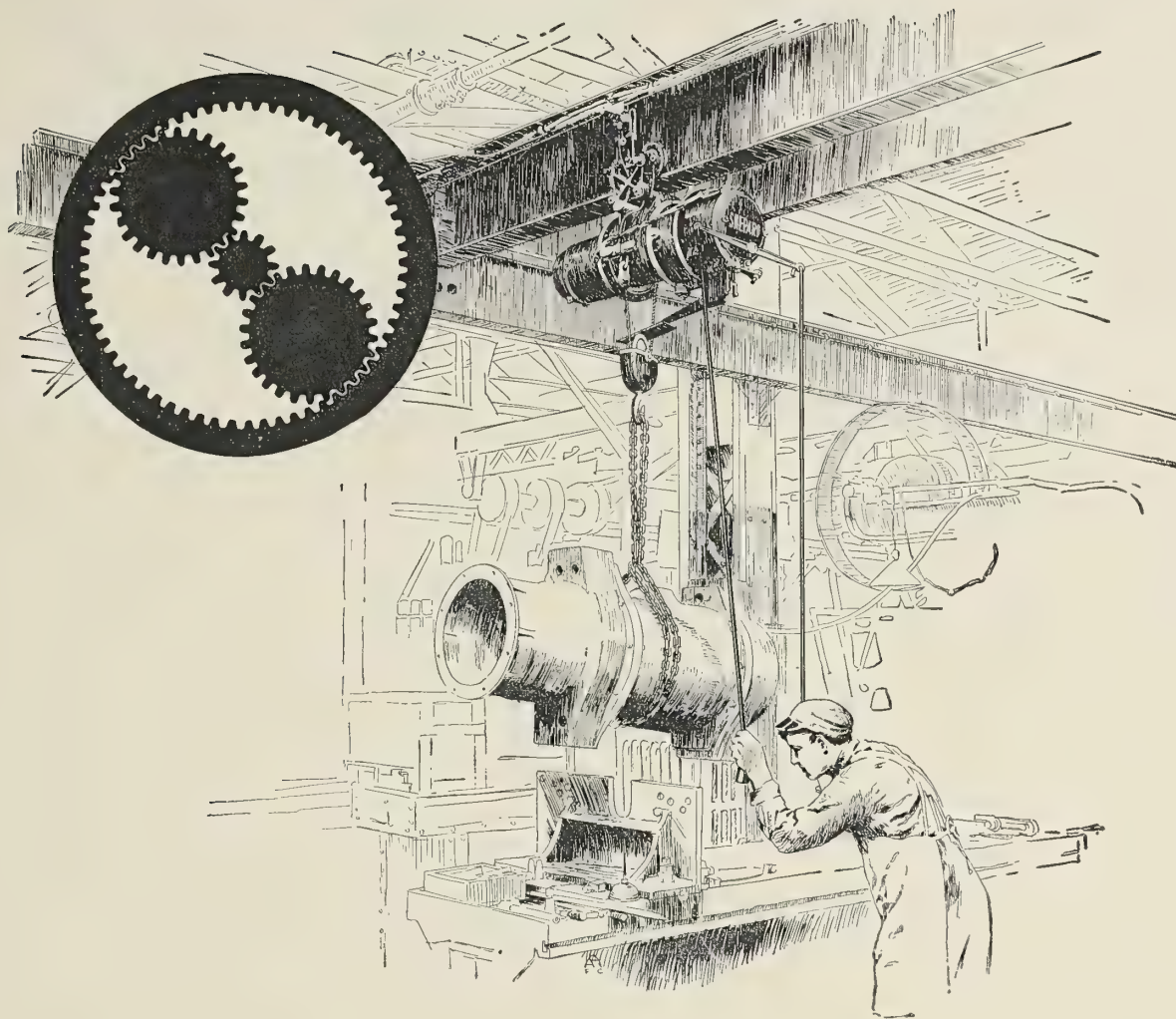
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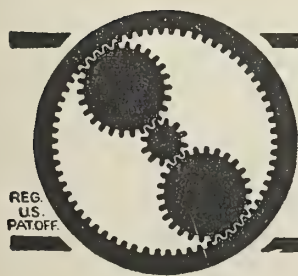
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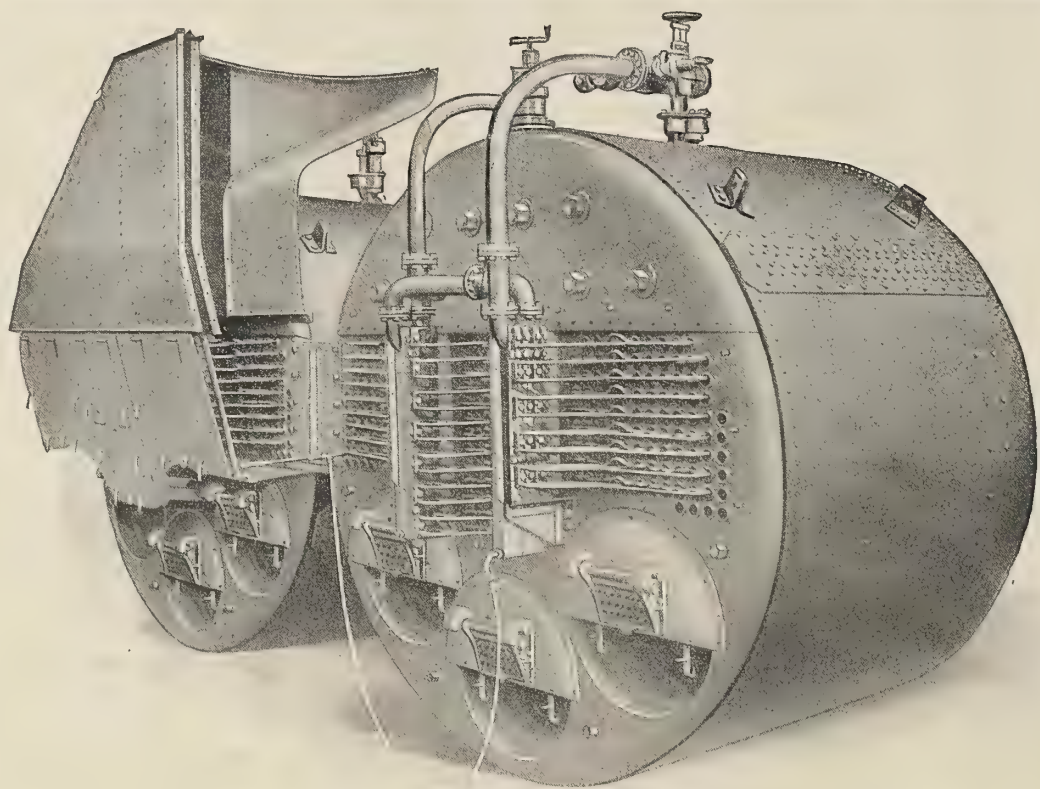
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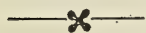


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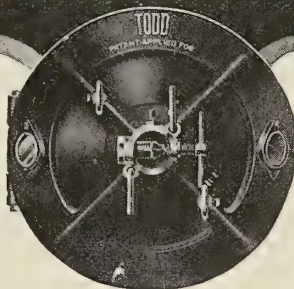
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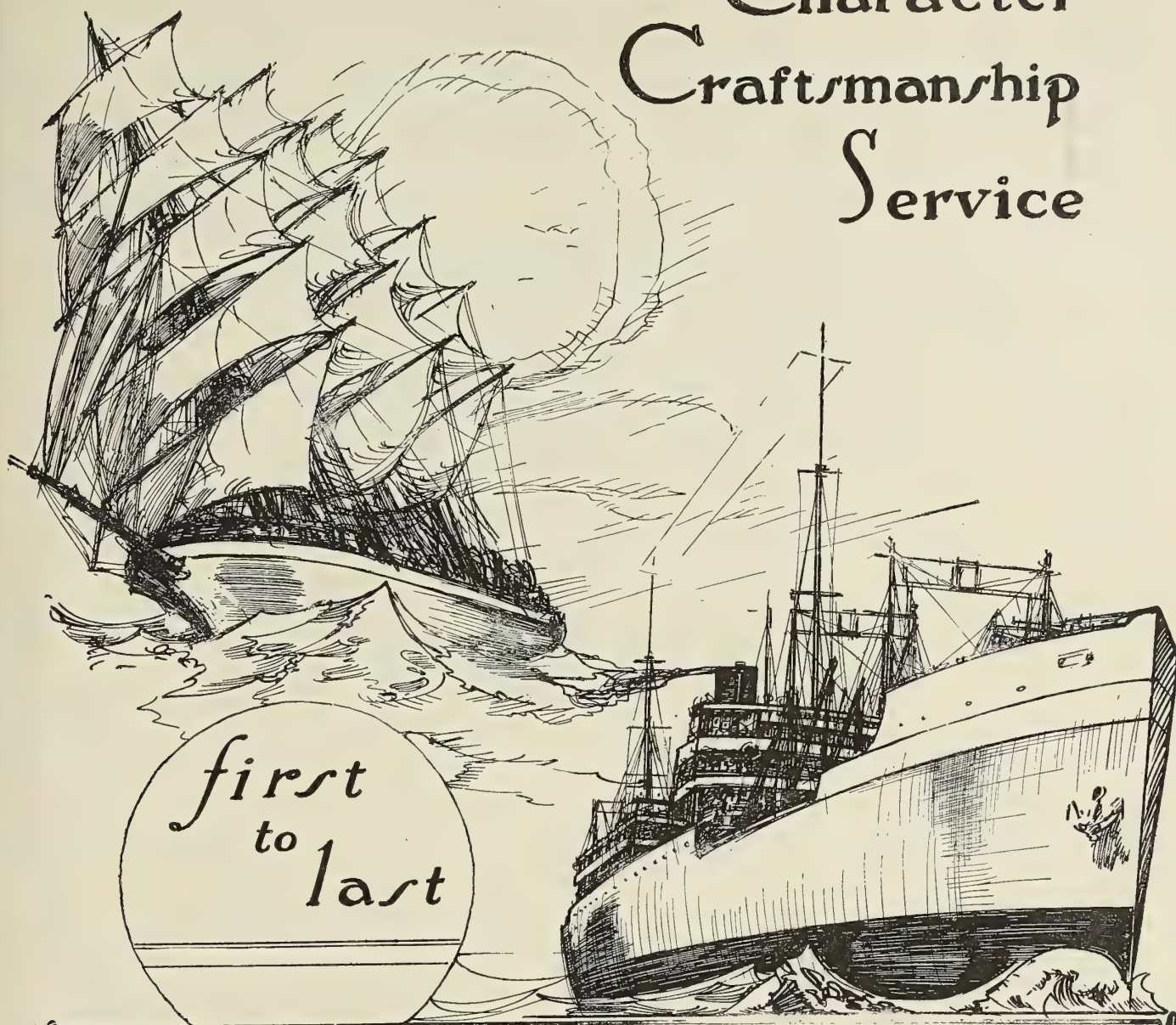
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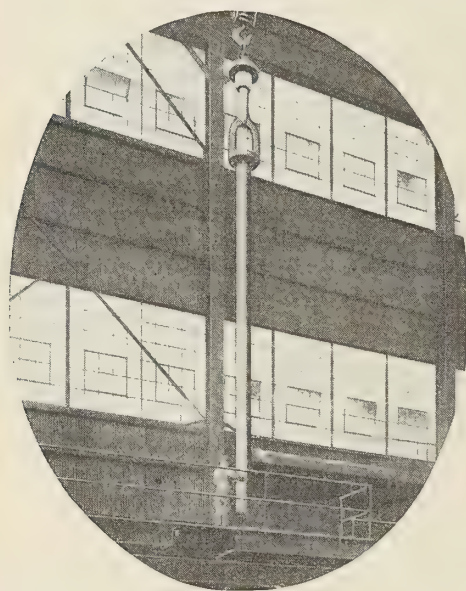
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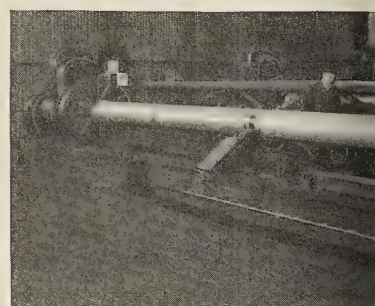


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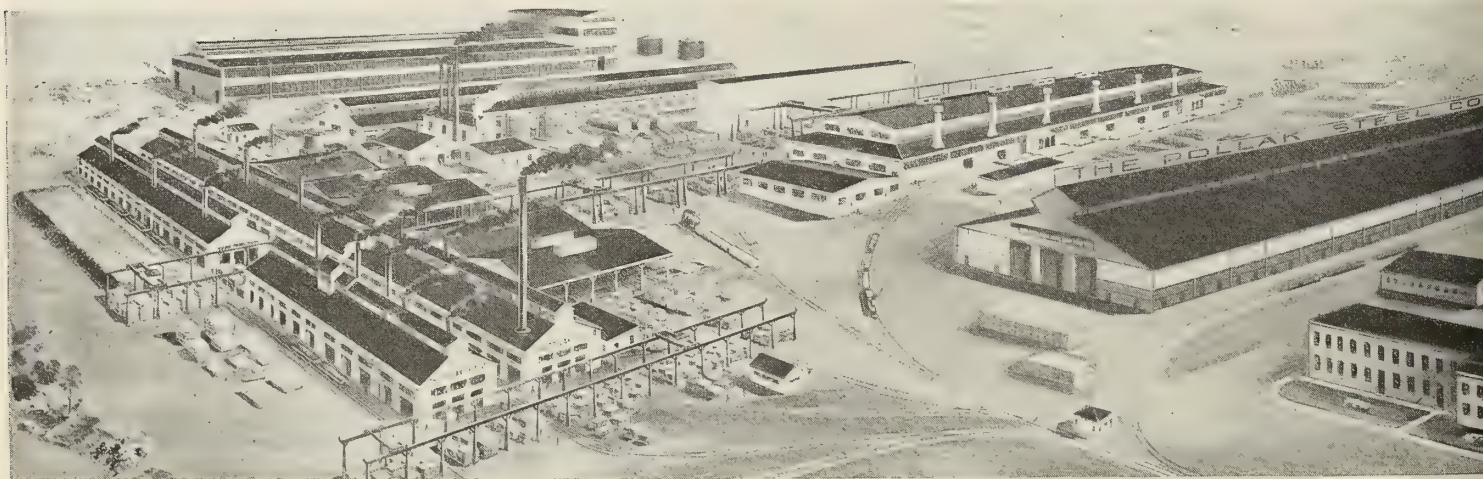
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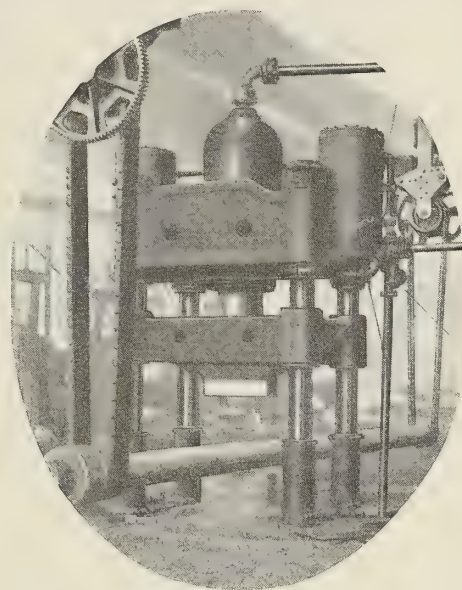
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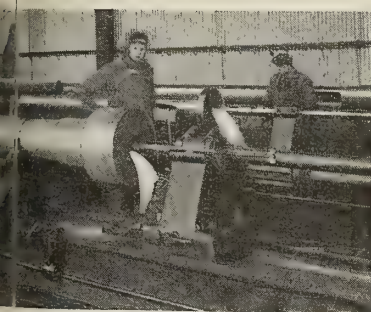
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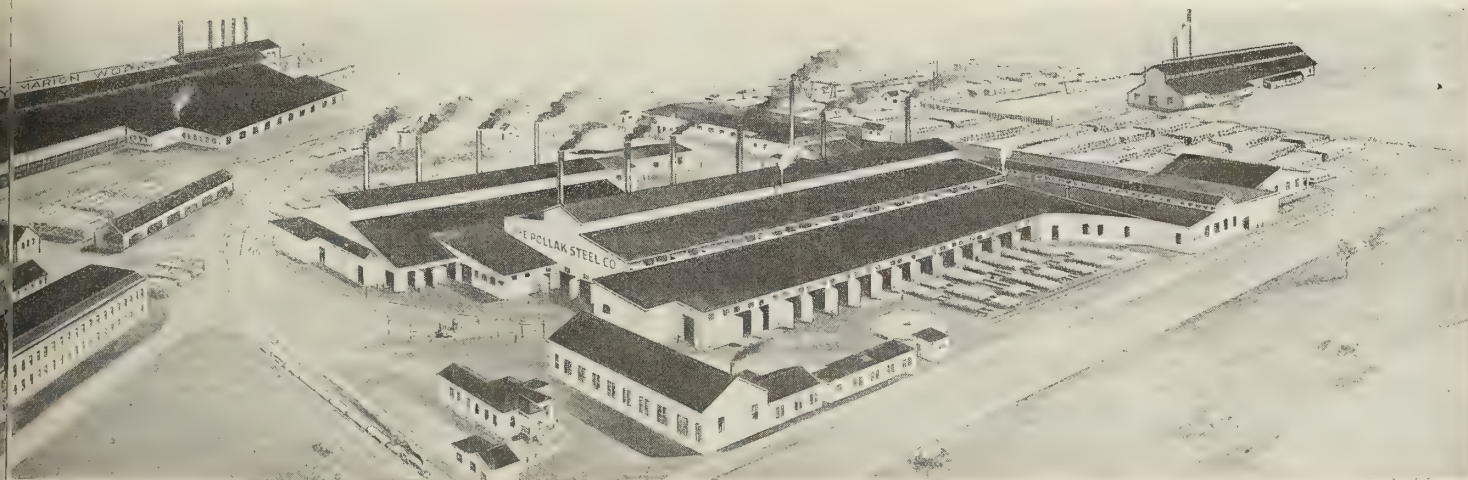


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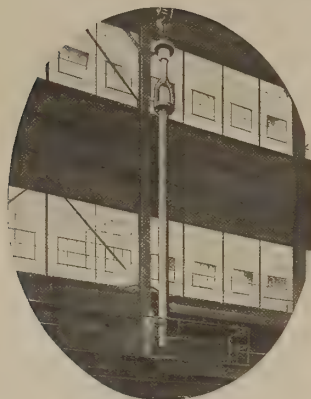
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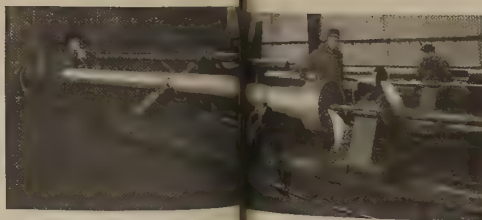


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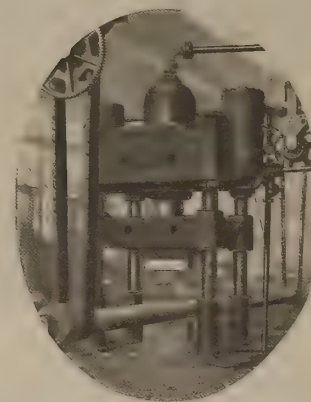
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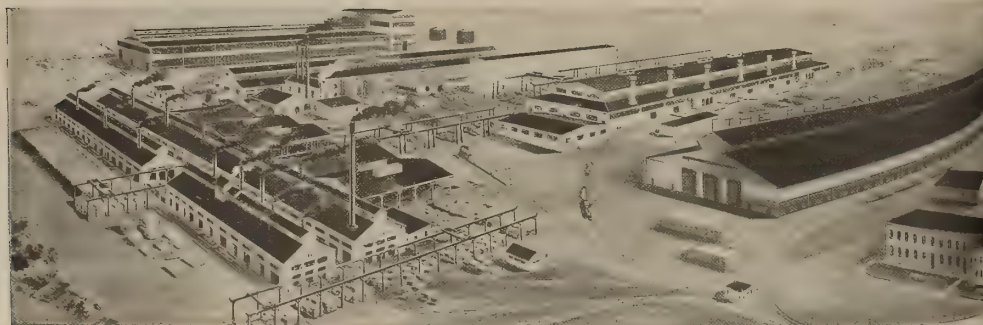
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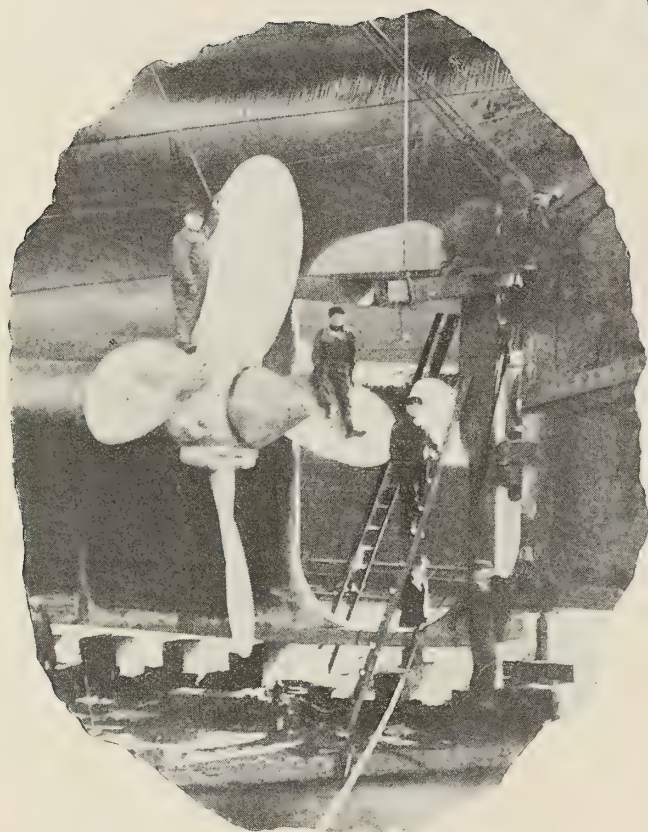
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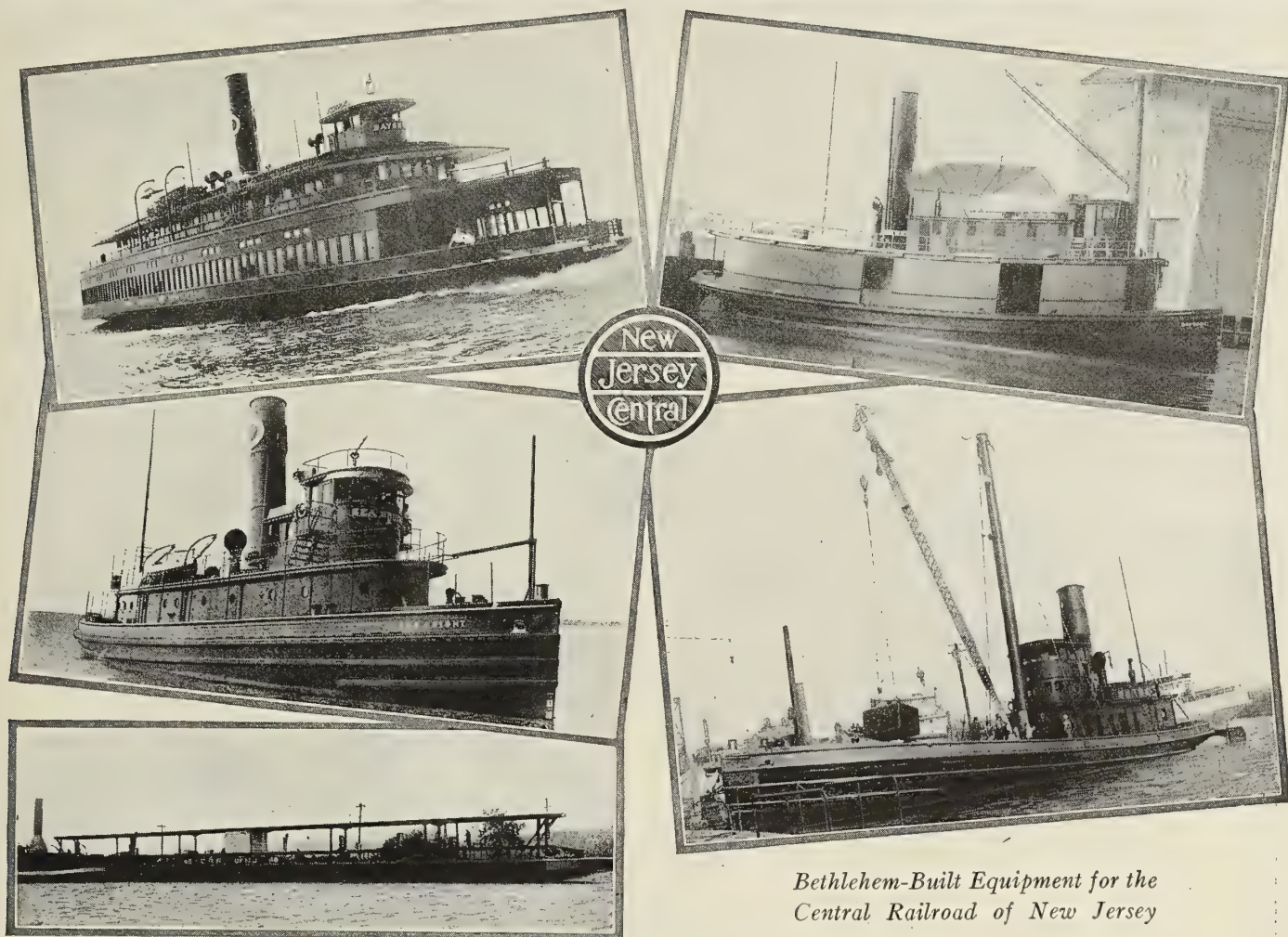
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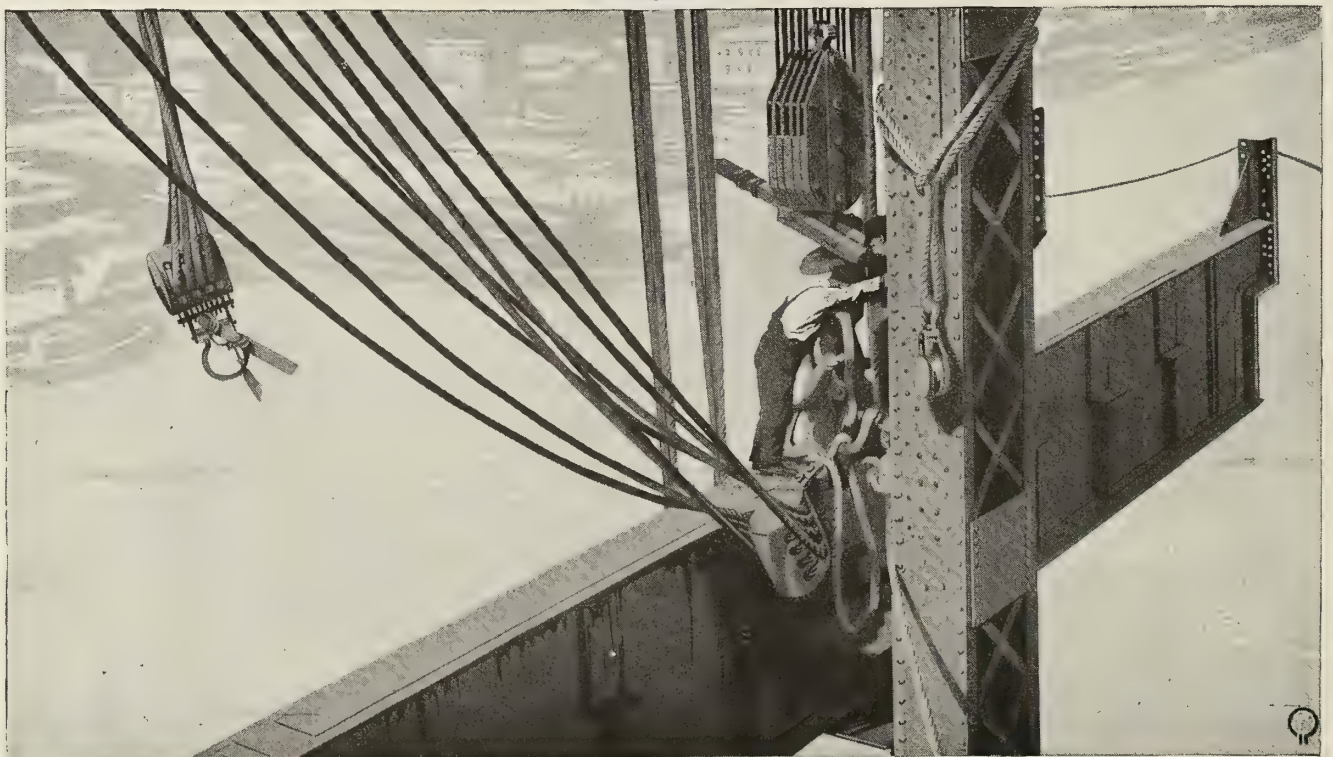
WHITLOCK CORDAGE COMPANY

46 South Street, New York

Factory and Warehouses
Jersey City
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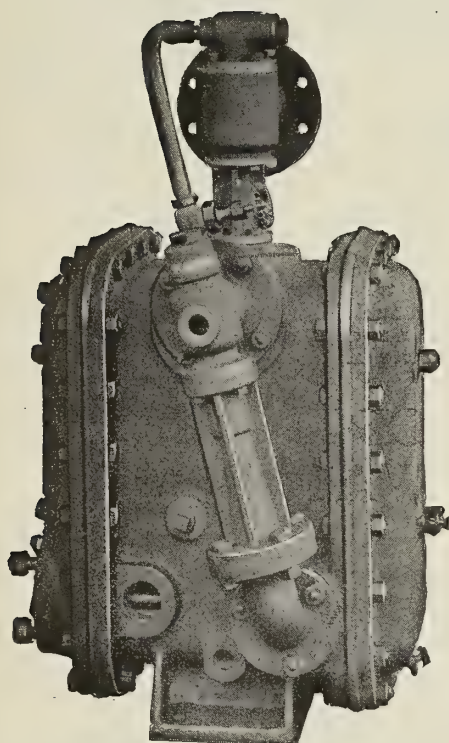


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WHEELER STEAM JET AIR PUMPS

Maintain High Vacuum Efficiently Without Complicated and Expensive Accessories



Other features of this type are:

- Compactness.** Runs up a vacuum quickly.
- Simplicity.** Is absolutely stable.
- Easily Started.** Requires no attention during operation.

IN the Wheeler Steam Jet Air Pump the inter-condenser between the two jets condenses the steam in the air-steam mixture from the first jet, reducing the volume to be entrained in the second stage jet. This reduces steam consumption to one-half that needed if no inter-condenser is used.

In the combined inter-condenser and heater type, here illustrated, condensate from the main condenser circulates through the inter-condenser and a heater receiving the discharge of the second jet, thus absorbing practically all of the heat of the actuated steam from the mixtures discharged by both jets. No air separating chamber is required and air is not introduced into the condensate or feed water.

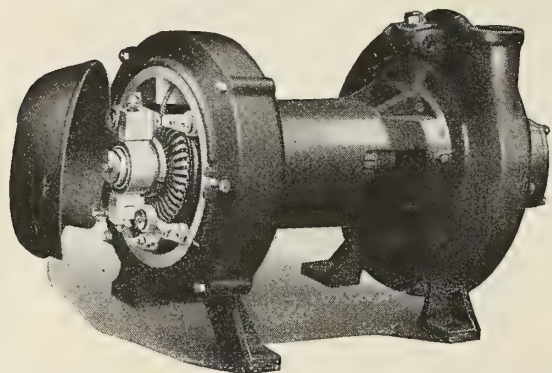
Thus, this type of Wheeler Steam Jet Air Pump maintains a high vacuum efficiently while returning practically all heat of actuating steam to the boilers without a complicated and expensive system of exhaust piping, of water tanks, traps or thermostatic regulators.

*There is a Wheeler Steam Jet Air Pump for every high vacuum service.
Our new Catalog 112-C fully describes these pumps.*

WHEELER CONDENSER & ENGINEERING CO.
CARTERET, NEW JERSEY

Complete Condensing, Evaporating and Pumping Equipment

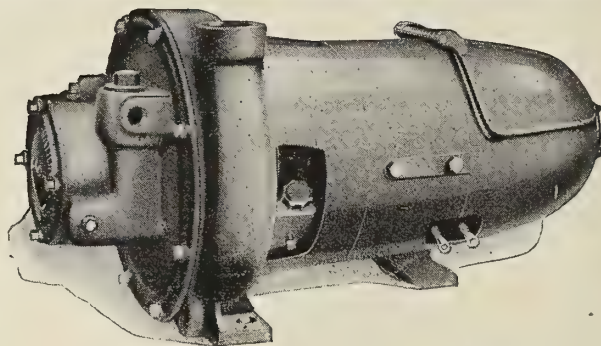
FOR LIGHTING ALL MARINE CRAFT —PYLE-NATIONAL TURBO-GENERATORS



Capacity 1500 watts
Voltage 110 volts
Height 18½ in.

Width 16½ in.
Length 30 in.
Net weight 275 lbs.

OVER
90,000
HAVE
BEEN
SOLD



Capacity 3 to 5 KW.
Voltage 32 to 220 volts
Height 19 in.
Width 20¾ in.
Length 39 in.
Net weight 500 lbs.

"E-S" TURBO-GENERATOR

These Turbo-Generators are Self Contained Units that do not require expensive foundations, switchboards, rheostats or other regulating devices, making the installation very simple and inexpensive.

They come to you ready to set up and operate continuously without trouble.

"M" TURBO-GENERATOR

Capacity Ratings range from ½ to 5 KW. in Single Units. A Double Unit Installation, connected in parallel, will give you not only double capacity (10 KW.) but also the desirable feature of a duplicate lighting plant, in emergency, and at a lower initial cost than any single unit of like capacity.

FOR CANAL WORK—HARBOR WORK—DOCKING A SHIP—FLOOD LIGHTING WATER, ETC.

COMBINATION SEARCH AND FLOOD-LIGHTS

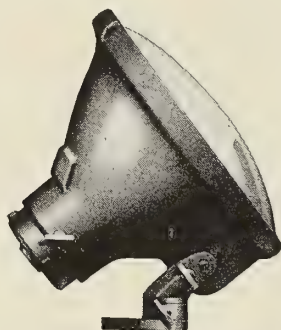
A Powerful Light for use on Pilot House, Bridge or Deck

They throw a flood-ray and spot-ray at the same time without changing focus. Lamps up to 1000 watts may be used with 12" size and up to 250 watts in 10" size.



The 12-inch light may be had with or without Pilot House Control.

12" Search and Floodlight
NO ADJUSTMENT REQUIRED
SAFE, CLEAN, SIMPLE



10" Search and Floodlight

These are most durable and efficient lights for marine work and are designed expressly for such purpose.



Pyle-National
Steam Turbine
Driven Fan

14 AND 18 INCH
SIZES
100,000 and 200,000
cubic feet of air
delivered per hour

BALL BEARING SELF-OILING

Dimensions

14-inch Fan—15½ in. high, 15 in. wide, 12½ in. long
18-inch Fan—19 in. high, 19 in. wide, 12½ in. long

ELIMINATES ALL ELECTRICAL TROUBLES
Operates on steam pressure from 30 pounds and up and at less than the cost of operation of an electric driven

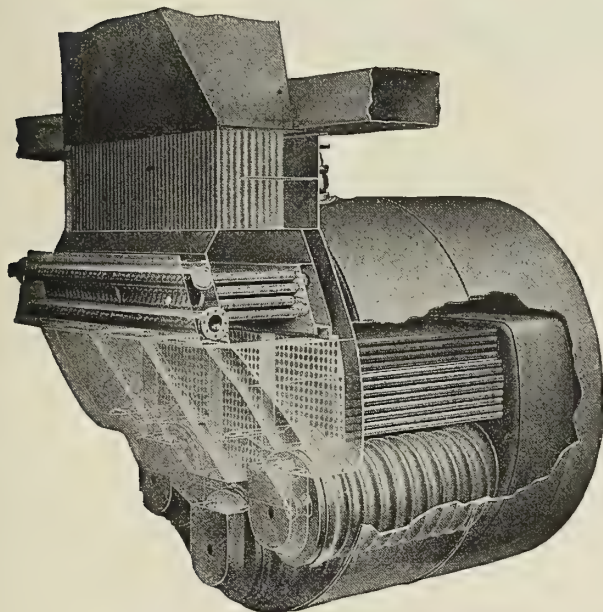
THE PYLE-NATIONAL COMPANY

The Largest Manufacturers of Small Steam Turbines

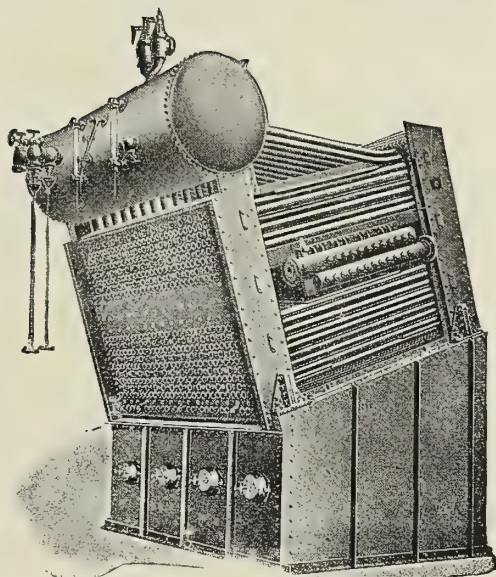
New York Office
30 Church Street

General Office and Factory
1334 N. Kostner Avenue
CHICAGO, ILL., U. S. A.

The increasing use of superheat in the marine field



Foster Superheater in-
stalled in uptake of
Scotch Boiler



Foster Superheater in-
stalled in tube bank of
Foster Marine Water-
tube Boiler

The cost of marine fuel has increased in the last few years to a point where it is receiving considerable attention. To improve the fuel economy of marine propelling equipment, water-tube boilers, turbines, and high vacuum equipment have been installed, on many ships, and over one thousand ships have been fitted with superheaters.

The fuel consumption of an existing installation can be reduced at less expense by adding superheaters than by any other method, and the fuel saving effected by Foster Superheaters is greater than obtained from high priced, high grade equipment of other types. In many cases the cost of Foster Superheaters has been saved in from two to three years' operation. This is particularly true in the case of Scotch marine boilers, where the superheat can be obtained from the waste gases without any additional fuel being burned.

In a very recent case a large tow boat company checked the performance of two duplicate tugs, one with and the other without Foster waste heat type superheaters. The fuel saving of 20% is paying for the superheaters in less than two years.

In many Scotch boilers the steam space is small and when the boilers are salted severe priming occurs, causing rapid wearing of turbine blades or short life of engine piston rings. Foster waste heat superheaters entirely eliminate this trouble and save considerable in turbine or engine repairs. This also prevents delays in the ships' operation, which results in a very attractive additional saving.

Superheat has become standard in land plants and at the present rate of progress will be standard in marine plants in the next few years. If America is to keep her place on the seas her ships must follow the proven economy of her land plants. The American stationary plants are admitted the peer of all others and the American marine plants will unquestionably win the same prestige when advantage is taken of known successful fuel saving methods.

Send for the Foster Superheater Book

POWER SPECIALTY COMPANY

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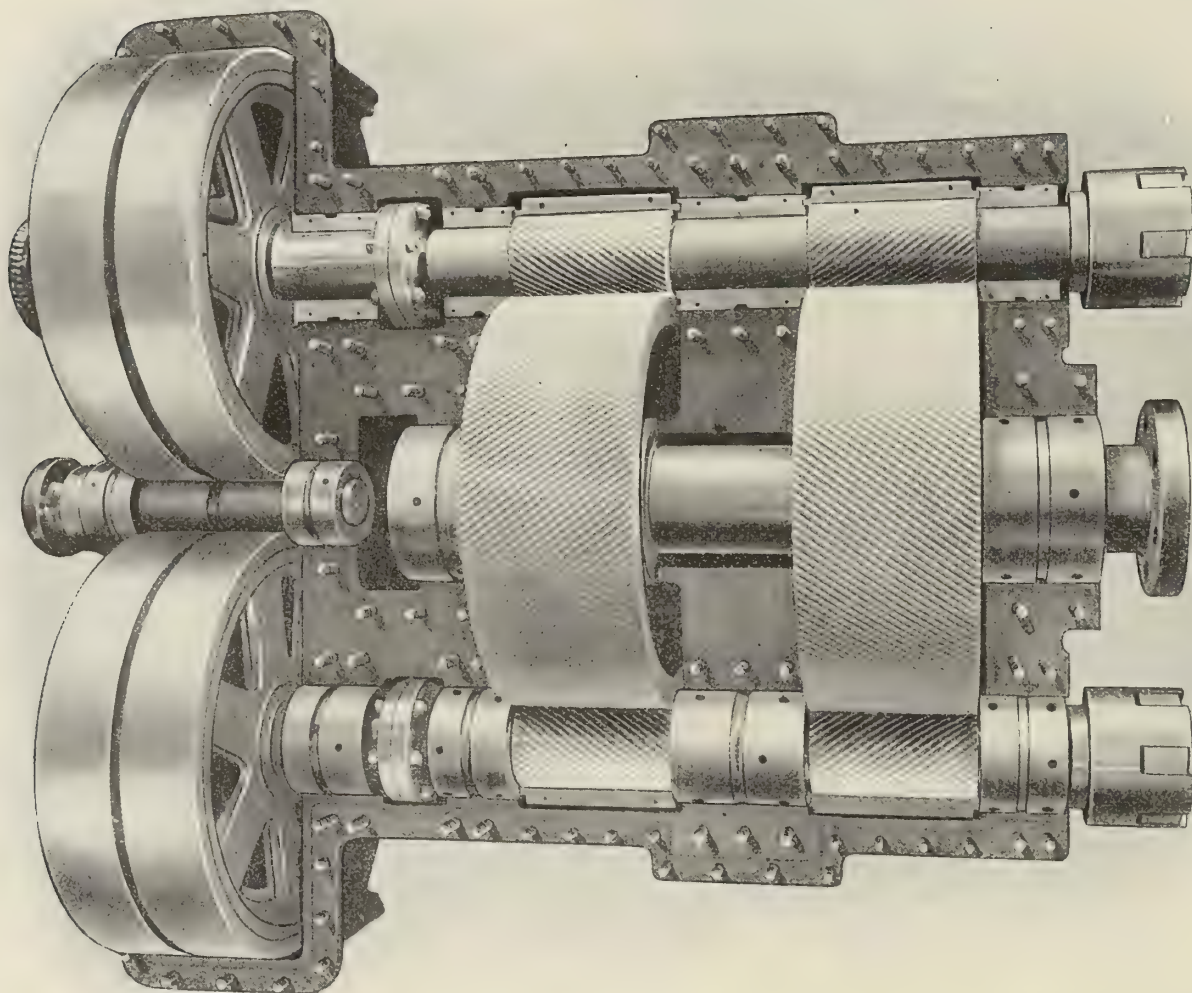
New Orleans, Marine Supply Co.

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FOSTER SUPERHEATERS

KERR

MARINE REDUCTION GEARS
100% ACTUAL PERFORMANCE
QUIET—RELIABLE—EFFICIENT



Plan View (cover removed) 2500 to 3000 S.H.P. Type

Manufacturers of Geared Turbine Propelling Machinery in capacities up to 6000 S.H.P.
Also Turbine Driven Auxiliaries, all sizes.

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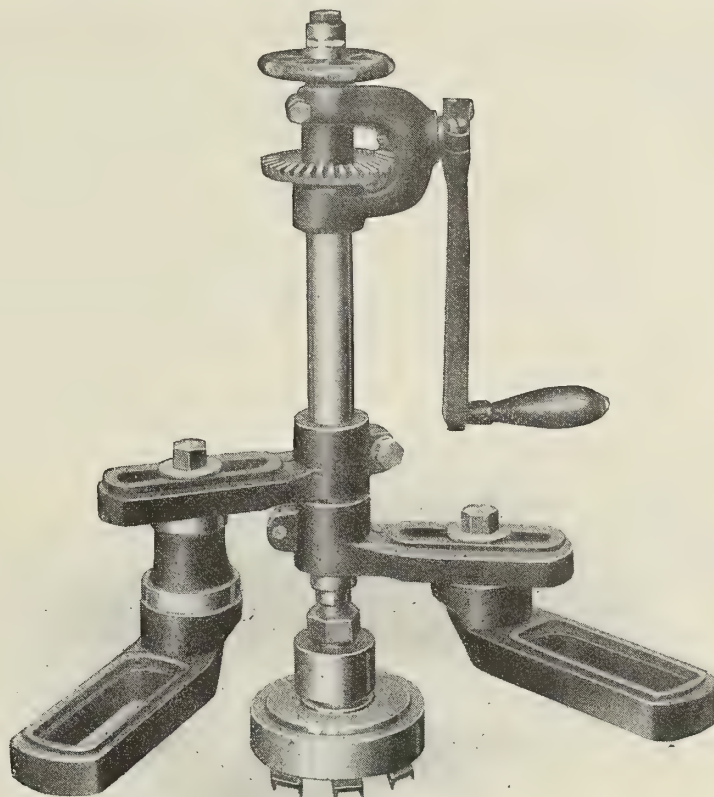
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HOW LONG DOES IT TAKE to remove and reface your pump valves?



THE DEXTER

refaces them while they are in the deck. It is not necessary to remove them. They can be refaced in half the time it requires to take them out.

This can be done 10 to 20 times.

No more seats warped or broken taking them out of the deck.

SAVES TIME—SAVES MONEY.

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The Leavitt Machine Company
ORANGE, MASS., U. S. A.

Manufacturers of Dexter Globe, Gate and Pump Valve Reseating Machines

Electric!

The First Electrically Driven Ferry

Diesel Electric Drive doubles vehicle capacity, reduces fuel consumption one-half, and eliminates standby losses and smoke. Manoeuvring is facilitated and the entire control of the boat is in the hands of the pilot.

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COLUMBIAN *Tape-Marked*

This Red, White and Blue *Tape-Marker*

—positively identifies and guarantees the strength, durability and service of every foot of Columbian Tape-Marked Pure Manila Rope—a modern product, made with modern machinery and methods in the most up to date Cordage plant in the country.

From the time that Columbian representatives select the fibre in the Philippines until the completed rope is coiled and ready to ship, frequent and rigid inspections are made during the various stages of manufacture. The result is a high grade rope that we are glad to back up with an absolute guarantee.

Buy Columbian Red, White and Blue Tape-Marked Rope.



Columbian Rope Company

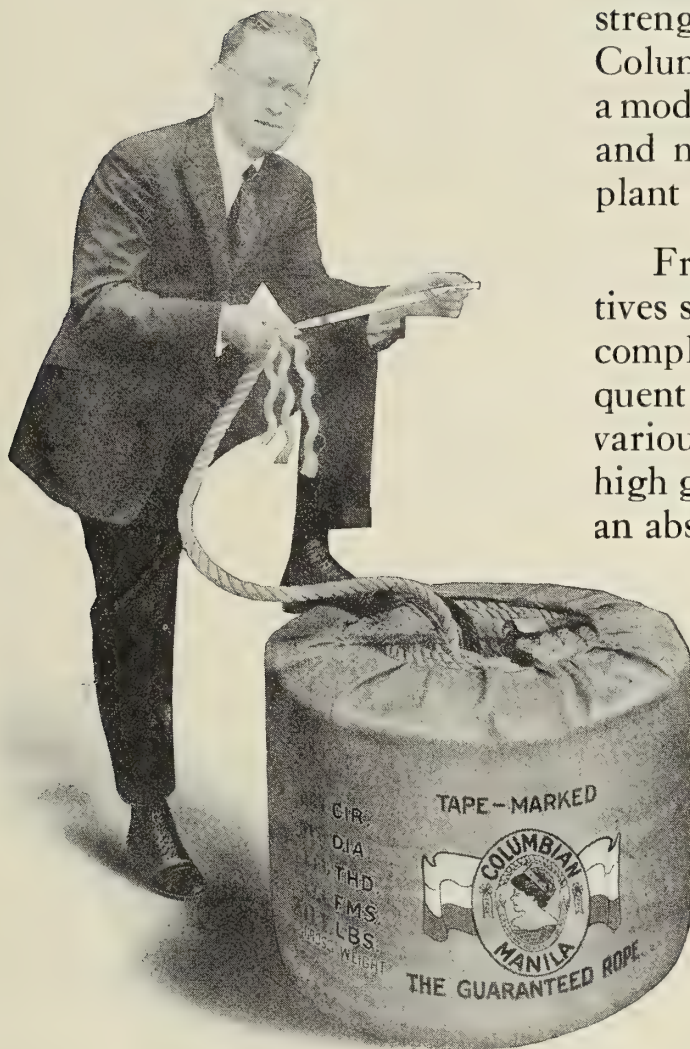
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Pure— Manila ROPE



A coat of armor against rust

Men that own and operate ships are large users of Dutch Boy Red-Lead — the tough, elastic, waterproof paint that protects metal surfaces from rust.

The U. S. Navy, for instance, uses red-lead on all its vessels for almost every metal surface, because it withstands the action of salt water and preserves the steel.

Dutch Boy Red-Lead has the added advantage of greater spreading power than other paints for marine use. It gives a coat of uniform thickness and toughness, and won't chip, peel, or scale.

Dutch Boy Red-Lead does not harden in the pail. That means no red-lead wasted. No time lost.

Specify Dutch Boy Red-Lead for all metal surfaces, paste or liquid form. Can be tinted to your requirements for finishing coats.

Write for Painting Helps No. 6.



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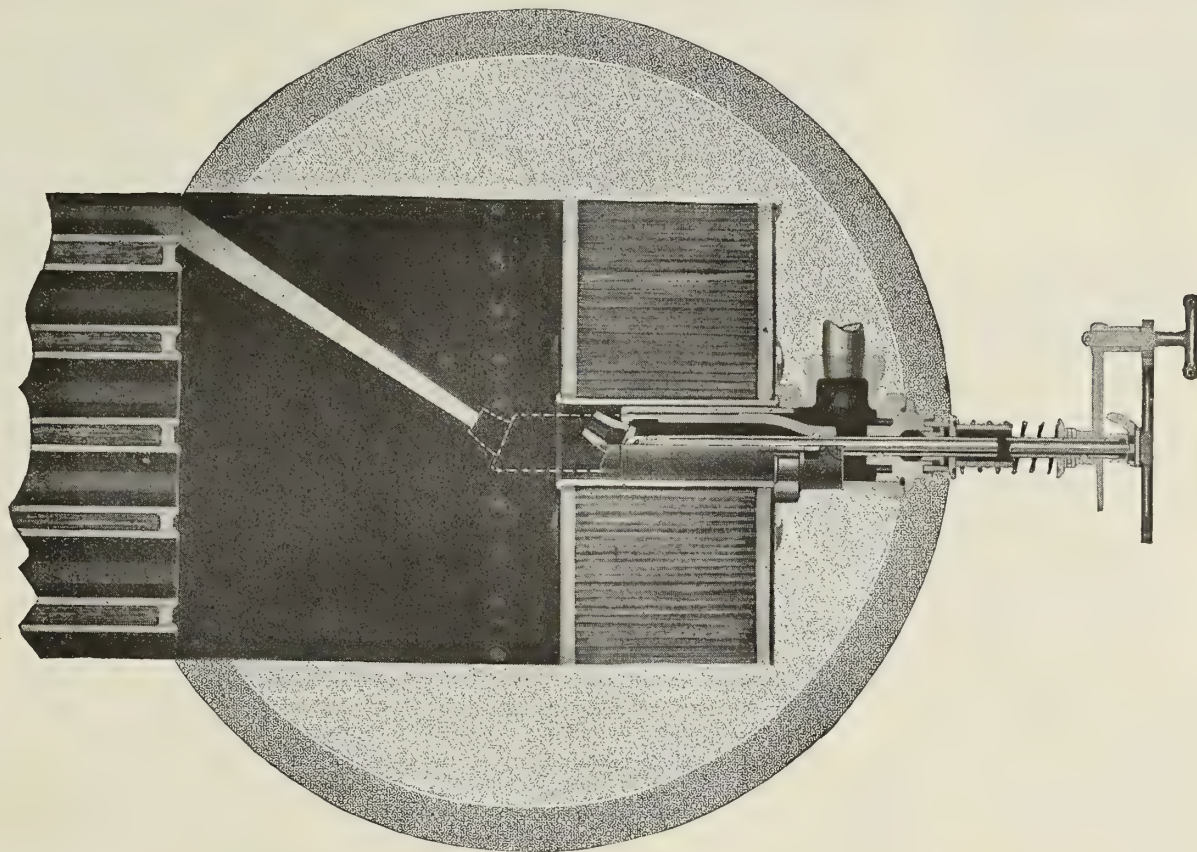
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"Save the surface and
you save all" — Paint & Varnish

Dutch Boy Red-Lead



SOOT REMOVAL FROM SCOTCH MARINE BOILERS

is effectively accomplished by the improved Diamond Rear End Blower (Model B).

And soot removal is essential to economy. Power is one of the largest items of expense in the cost of operating a vessel, and the cost of fuel represents on the average 70 per cent. of the cost of power. The presence of soot has cost—it still costs—a loss of hundreds of thousands of tons of coal and hundreds of thousands of barrels of fuel oil a year to ship owners. Soot waste has been eliminated on many ships, and it can be eliminated on all with a consequent notable increase in boiler efficiency and a consequent great increase in marine profits.

Thousands of Diamond Model B Blowers are in use today on Scotch Marine boiler. The blower is permanently installed through the rear water leg, a hole being cut in the plates and a section of tubing expanded and beaded into place. The blower is encased in this tubing. When not in use the blower is secreted in the casing. As the steam is turned on the nozzle is automatically forced forward into blowing position. In operation dry steam is shot into each tube with the draft at a terrific velocity, sweeping and scouring the soot from the full length of the tubes.

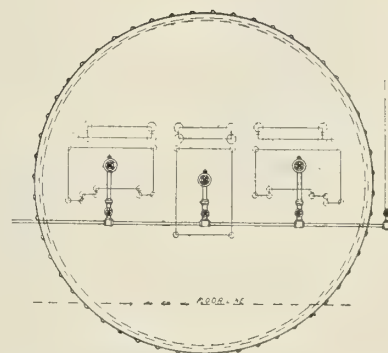
Diamond Soot Blowers save fuel and labor. Write for full information on blowers for any type of boiler, requesting your copy of Bulletin 134, "How Some Ship Owners Have Increased Their Profits."

(New York Address, 90 West St.)

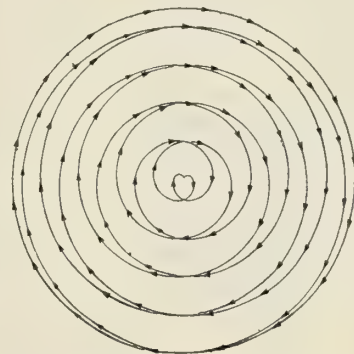
DIAMOND POWER SPECIALTY COMPANY
Detroit, Michigan

Diamond

SOOT BLOWERS - SAVE 4 to 8% FUEL



Method of installing Model B blowers on a three-furnace Scotch boiler.



The arrows show the course of the steam jet as it travels over the tube sheet, blowing every tube.



Guaranteed MARINE PLUMBING

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Our line of bathroom accessories
includes fixtures of every type
and size for the modern bath-
room. Same can be furnished in
cellu-white or nickel-plated
finish.



Plate F-1208

Plate F-1208—The "Model" heavy vitro-adamant syphon action washdown flushing rim bowl, with large waterway and special jet; N. P. brass flush pipe. Oak 16 oz. copper lined tank with water-tight cover; oak seat and cover.....\$42.50
Same, mahogany finish wood-work\$45.00
Galvanized cast iron base plate add\$3.50

Outlet of closet fitted for lead pipe connection unless otherwise specified.



Plate F-1240

Plate F-1240—The "Corinth" vitro-adamant oval flushing rim syphon jet closet with vitro-adamant low down flush tank with water-tight cover. Oak seat and cover with N. P. brass bar post hinges. Deck flange for lead pipe connection; 1/2" N. P. supply pipe.....\$70.00

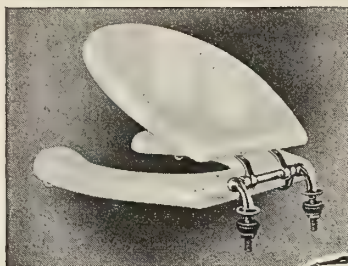


Plate F-1260

Plate F-1260—Sands "Atlas" cellul-white open front seat with cover, N. P. brass bar post hinges\$14.75
Fits standard size closet bowls.

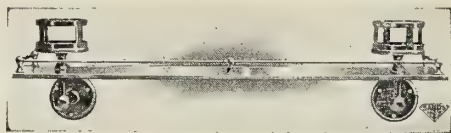


Plate F-1810

Plate F-1810—Sands plate-glass shelf 5" wide x 3/8" thick, N. P. brass guard rail with combination tumbler holders and brackets. Lengths: 18", \$10.50; 20", \$11.00; 24", \$11.50; 30", \$12.25



Plate F-688

"Alcona Folding" Lavatory, zinc reservoir and waste receiver, vitro-adamant basin, china soap holders, self-closing supply faucet. Polished quartered oak and mahogany. Price upon application. An ideal fixture for state-rooms.



Plate F-1230

The "Commercial" closet for above water line. Vitro-adamant flushing rim oval hopper, galvanized iron valve box; galvanized iron base plate. Handle galvanized malleable iron; operates composition quick opening non-hammering supply valve and waste pan; fitted with I. P. connection; painted white; trimmings N. P.; heavy oak seat and cover, \$82.50.



Plate F-555

Plate F-555—The "Serena" Stateroom Lavatory Combination—vitro-adamant lavatory, waste jar and supply pitcher. Lavatory is 17"x17" with integral back and bracket and moulded soap dish; N. P. chain stay, chain and rubber stopper, N. P. brass waste plug and tail piece; "Sands" special half round waste jar on concealed hanger. Cast brass loose key waste cock; key can be removed only when cock is closed. N. P. cast brass bulkhead supply pitcher ring. \$33.25

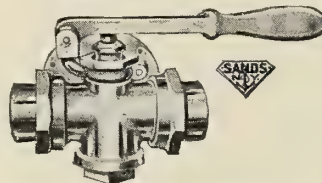


Plate F-1244—Sands "Dallas" slow self-closing non-hammering closet supply valve with union connections for 1 1/4" iron pipe. Lever handle and bulk head flange, nicked finish. \$15.00

Plate F-1244A—"Dallas" valve with chain and pull for overhead installation.\$15.00



Plate F-2031

Plate F-2031—The "Helena" composition outboard connection with flap valve, flanged outlet.

Size	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"
Iron pipe	\$3.25	\$5.00	\$6.00	\$7.00	\$11.00	\$16.50
Lead pipe	3.80	6.00	7.25	8.75	14.00	22.00

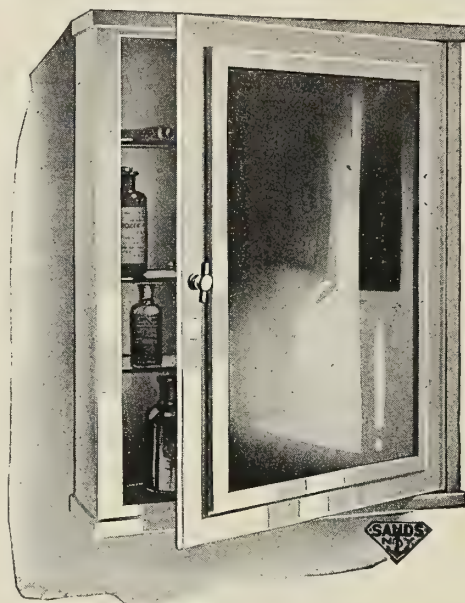


Plate F-1800

Plate F-1800—Sands white enameled steel medicine cabinet; three adjustable plate-glass shelves; plate-glass mirror.
No. 1—5"x18"x23", mirror 12"x18". Price....\$40.00
No. 2—5"x24"x29", mirror 18"x24". Price.... 68.00
We also furnish medicine cabinets in wood, white enameled Genuine Mahogany or Oak. Prices upon application.

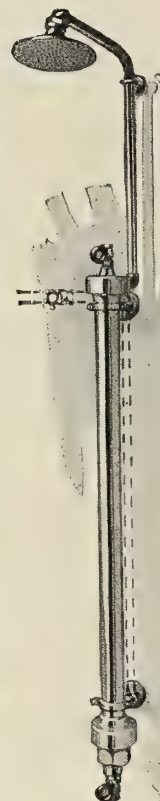
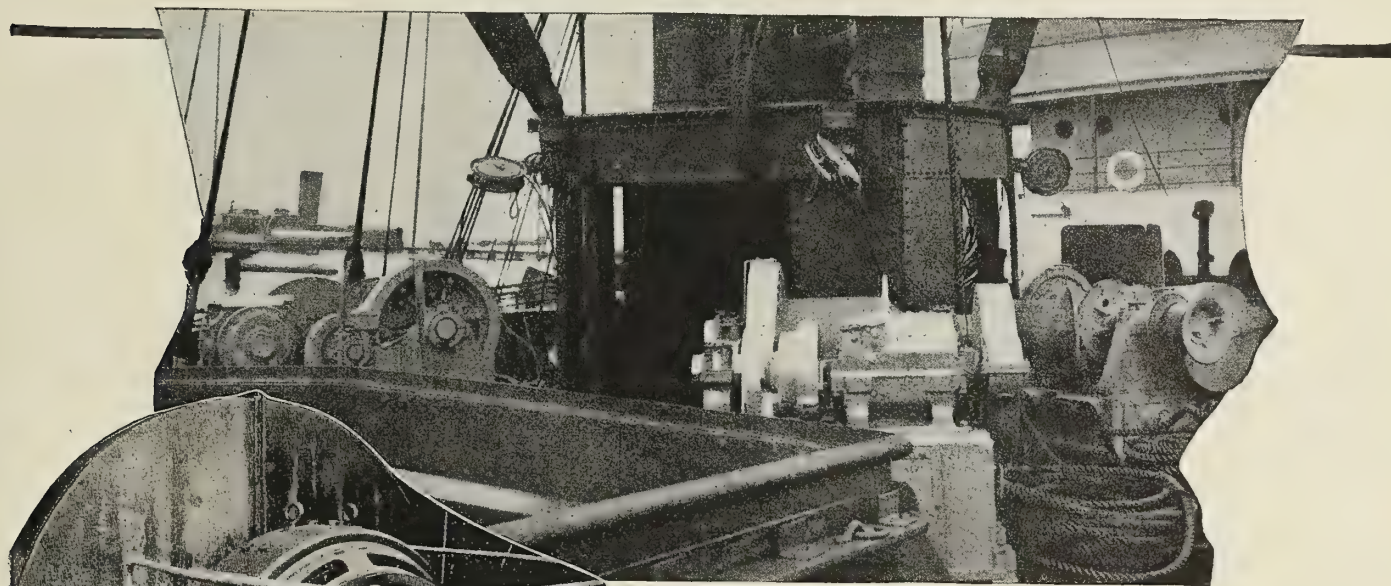


Plate F-245

Plate F-245—Sands combination 4' N. P. brass heater and shower, with brackets to bulkhead. 6" diameter cast brass shower head with adjustable ball joint with N. P. steam, water and drain valves. Price complete, \$62.50.

A. B. SANDS & SON COMPANY
22-24 Vesey Street New York, N. Y.

To meet keen competition, economical operation is as essential to ships as to modern factories



A typical installation of G-E motor driven cargo winches

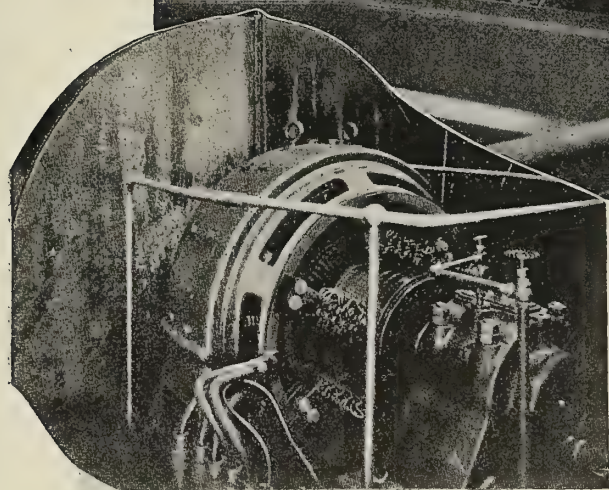
Electricity Makes Good Ships Better

Why do owners and masters of ships equipped with steam driven auxiliaries strive to save time, fuel and labor, to prevent losses from condensation, throttling, radiation, leakage, and low efficiency when it all can be accomplished so easily with electricity?

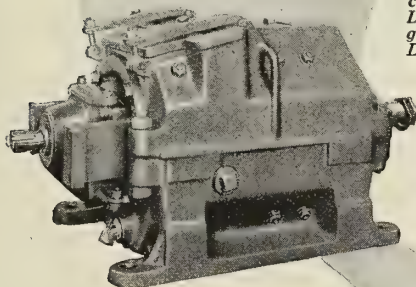
G-E Marine Generators, Motors and Control Apparatus are built for sea service, rugged, compact, safe, always ready, easy to control, and have proved all claims made for them.

This is fully realized by men who, with electric power, operate anchor windlasses, cargo winches, boathoists, steering gears, warping and mooring winches, pumps, cranes, blowers, machine tools, fans, and other auxiliaries.

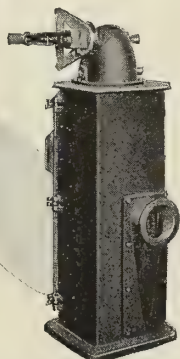
*The electric way is the modern way—
the proved economical way*



G-E Generator direct connected to engine. Larger sizes of this generator are used for Diesel Electric Drive



G-E Watertight D-C Motor with hinged cover which provides easy access to working parts

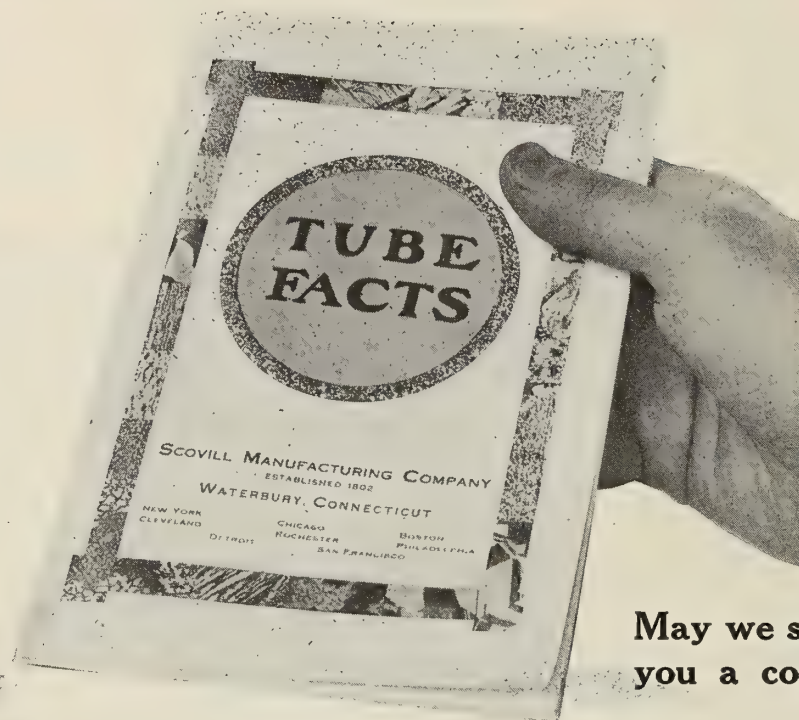


G-E Watertight Drum Controller

General Electric Company

General Office
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Sales Offices in
all large cities



May we send
you a copy?

Why do Condenser Tubes Fail?

CONDENSER tubes would last forever if they neither SEASON CRACKED nor CORRODED. Metallographic investigations in recent years have thrown new light on the causes of season cracking and modern manufacturers have taken steps towards preventing this very objectionable condition. As for corrosion, we cannot entirely prevent it. We can, however, often tell what causes it and we can either supply the proper alloy or suggest the necessary changes in operation to minimize it.

SCOVILL ADMIRALTY TUBING has a remarkable structure when seen under the microscope. Its grain is exceedingly fine and uniform in size. This fine dense structure, coupled with the fact that the metal is absolutely homogeneous and free from casting defects, offers the greatest resistance to corrosion. Scovill condenser tubing has remarkable stiffness and yet it can be flattened upon itself without cracking. It will stand an unusual degree of expansion and can be twisted without showing any distress. Its high degree of elasticity and its entire freedom from drawing strains make it immune from season cracking.

*Brass Mill Products of Every Description.
Manufactured Articles to Your Order.*

Brass
Bronze
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Sheets
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SMOOTH-ON IRON CEMENTS

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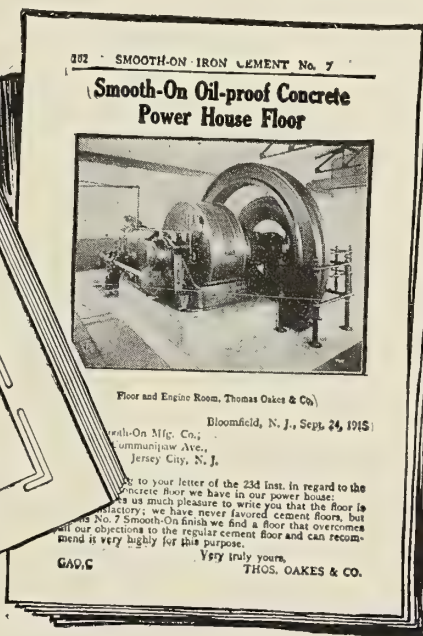
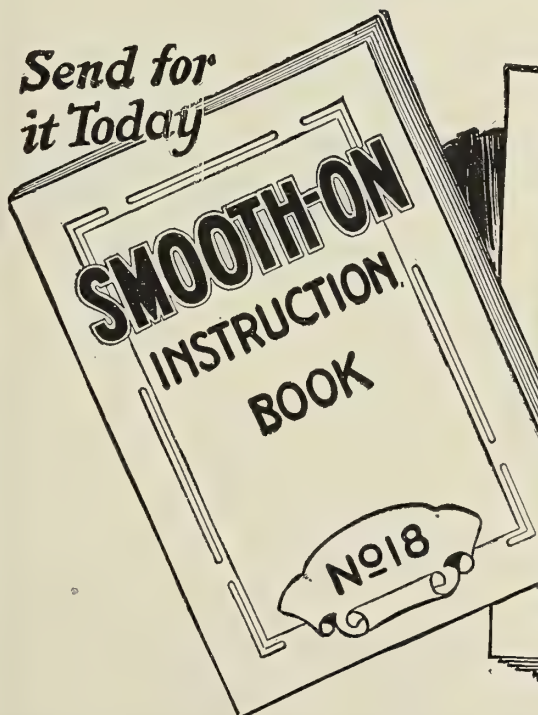
The Free Book That Tells All About Them

Smooth-On Instruction Book No. 18 is likely to be the most valuable book you own and it's free. All kinds of plant repairs made with Smooth-On Iron Cements are illustrated and described by the engineers who made them—it may be up to you to make similar repairs almost any day and the Instruction Book will be a big help.

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Est. 1895

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JERSEY CITY, N. J.
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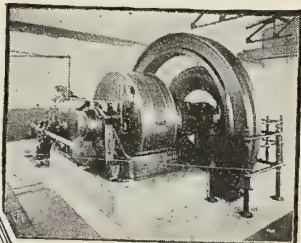
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295

202 SMOOTH-ON IRON CEMENT No. 7

Smooth-On Oil-proof Concrete Power House Floor



Floor and Engine Room, Thomas Oakes & Co.

Bloomfield, N. J., Sept. 24, 1915

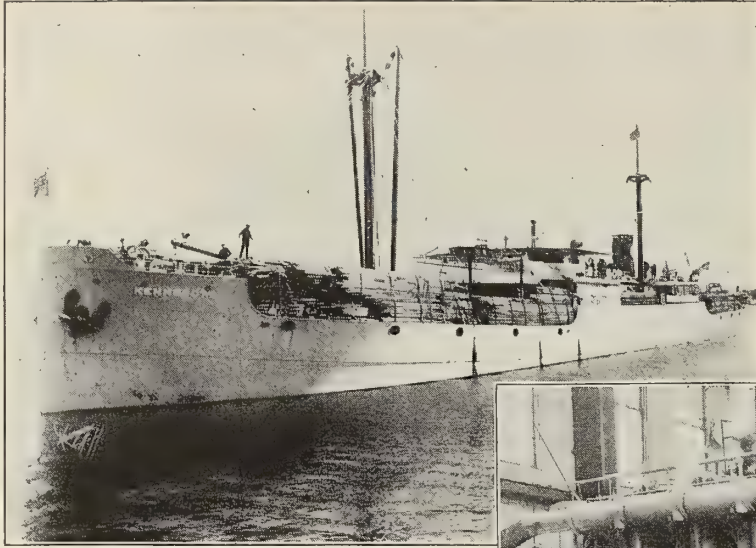
Smooth-On Mfg. Co.,
Communipaw Ave.,
Jersey City, N. J.

In reply to your letter of the 23d inst. in regard to the
concrete floor we have in our power house.
It is much pleasure to write you that the floor is
satisfactory; we have never favored cement floors, but
with No. 7 Smooth-On finish we find a floor that overcomes
all our objections to the regular cement floor and can recom-
mend it very highly for this purpose.

G.A.O.C.

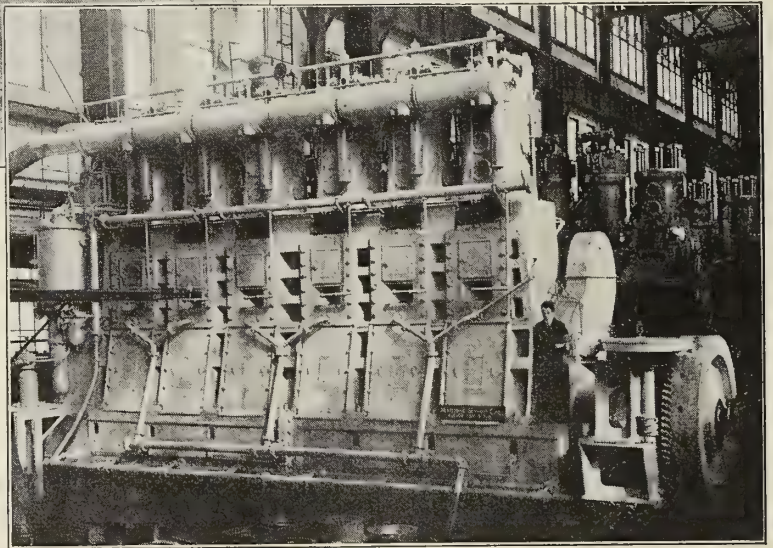
Very truly yours,
THOS. OAKES & CO.

Smooth-On Mfg. Co.,
Jersey City, N. J.
Gentlemen: Kindly send me a free copy of
Instruction Book No. 18 as per your
December advertisement in Marine
Engineering.
Name
Address



Motorship Kennecott
The most efficient ship that
sails the seas

This vessel is engined with two
of our 1200 IHP Diesel Marine
Engines



THE Motorship Kennecott, with her efficient McIntosh & Seymour Diesel Marine Engines, carries a ton of cargo 572 miles on one gallon of fuel oil.

Diesel driven Motorships can operate at a profit when freight rates are so low that steamship competition is rapidly eliminated.

We Build

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FOR ALL CLASSES OF SHIPS

IN SIZES FROM

390 TO 3000 HORSE POWER

MCINTOSH & SEYMOUR CORP.

AUBURN, NEW YORK, U. S. A.

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SAN FRANCISCO, CAL.

412 BISBEE BLDG.
JACKSONVILLE, FLA.

Why is this Copper Heater Coil Crimped?

**"The
Quick
Way
To
Heat
Water"**

The "crimped" copper coil shown at left is one of those which go to make up the heating surface of the

Reilly Feed Water Heater

The "Crimp" referred to above is an indentation throughout the length of the tubing. Due to the helical construction of the coils a whirling motion is imparted to the water passing through them and centrifugal force throws the water particles near the center of the tubes to the outside, while those on the outside are in turn displaced and returned to the center. The "crimping" of the tubing further assists in breaking up the body of water flowing through the coils and the rapid agitation of the water resulting from the helical type of coil, together with the crimped construction, insure remarkably high heat transfer.

Marine Engineers will appreciate these facts

Door in shell permits easy access to interior.

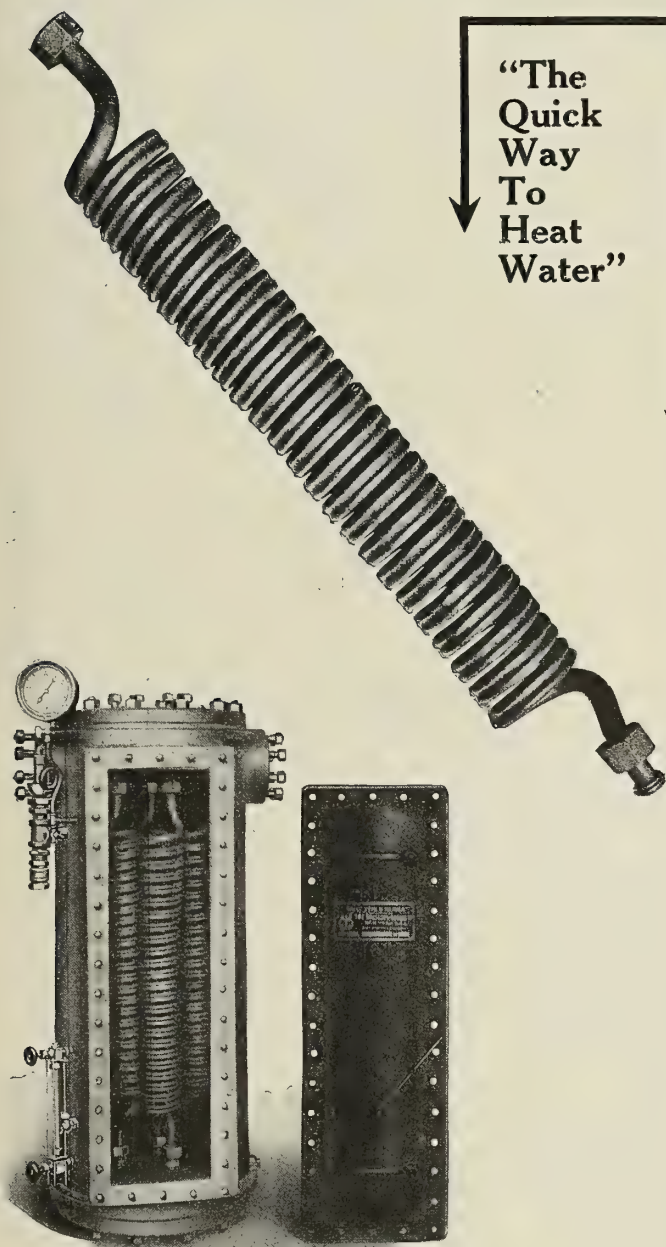
Coils may be removed by one man with a wrench.

All coils are interchangeable.

Every coil a spring—no expansion strains on coil joints.

Coils attached to manifolds by patented union joints free from brazing.

Send for Bulletin No. 510.



Reilly Type D Marine Heater



THE GRISCOM-RUSSELL COMPANY
2124 West Street Building, New York

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Boston
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Accumulated experience in the manufacture of WICKWIRE ROPE from the ore to the finished product, under exacting tests, makes this rope dependable.

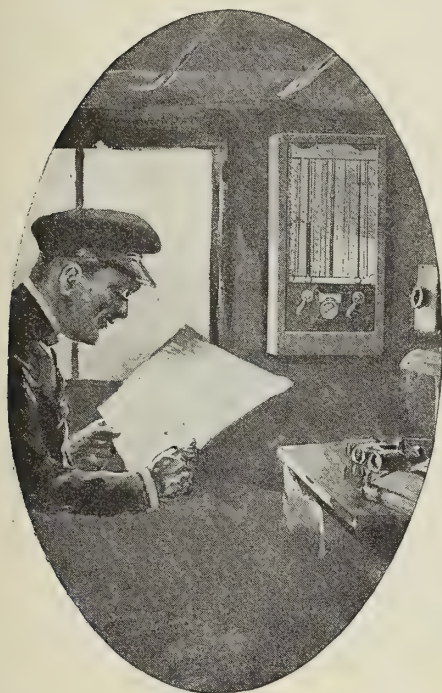


Wickwire

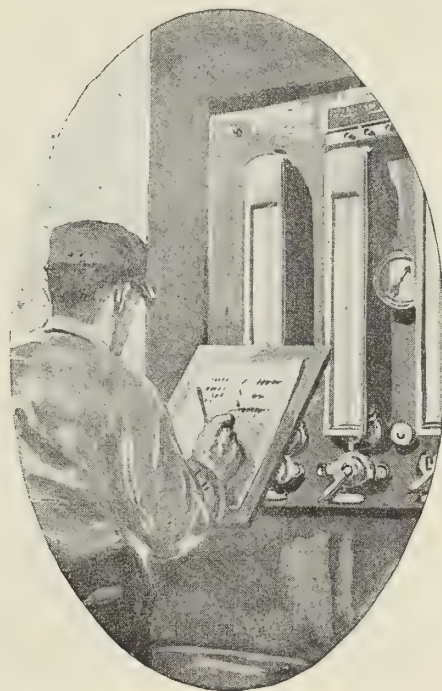
Wickwire Spencer Steel Corporation
WORCESTER, MASS. BUFFALO, NEW YORK
BOSTON · NEW YORK · PHILADELPHIA · DETROIT · CHICAGO · TULSA · SAN FRANCISCO

How much longer will you be content with the haphazard, old-fashioned way of measuring your fuel oil and draft?

The Pneumercator System



Is the modern efficient means of gauging tanks or measuring draft



WITH the **Pneumercator Draft Gauge** you can find the fore, aft or mean draft without leaving the ship.

It weighs bulk cargoes, loaded and discharged, shows trim and list.

The gauge may be located at any convenient point. No more going ashore or putting out in dory to watch draft marks—no trouble—no inaccuracy.

With the **Pneumercator Tank Gauge** you can keep tabs on your hourly consumption of fuel oil—check invoices and total withdrawals.

It is safe, convenient, accurate, dependable.

No danger of running low without forewarning—no need to flood decks—no guessing at some oil smeared mark on a sounding rod, no trouble or inconvenience.

Write for bulletin No. 102 now.

PNEUMERCATOR COMPANY, Inc.

15 PARK ROW

NEW YORK, N. Y.

P-122

TRADE MARK
Pneumercator
REG. U.S. PAT. OFF.
System



Photo by Edw. Levick, N. Y.

One of the Emergency Fleet wooden steamships that may soon be sold at bargain prices.

Over 80% of these boats are caulked with STRATFORD OAKUM which made a war record of not a single complaint or rejection and receives the highest approval of both Lloyd's and American Bureau.

STRATFORD OAKUM contains least waste, requires least labor and is the best and most economical caulking material to be had at any price.

George Stratford Oakum Co.

Jersey City, N. J.



Announcement

New Prices on

Union Wood and Steel Tackle Blocks are being compiled and will be ready for distribution to the trade on January 10th, 1922.

Don't overlook the opportunity; be prepared to meet the Spring demand for

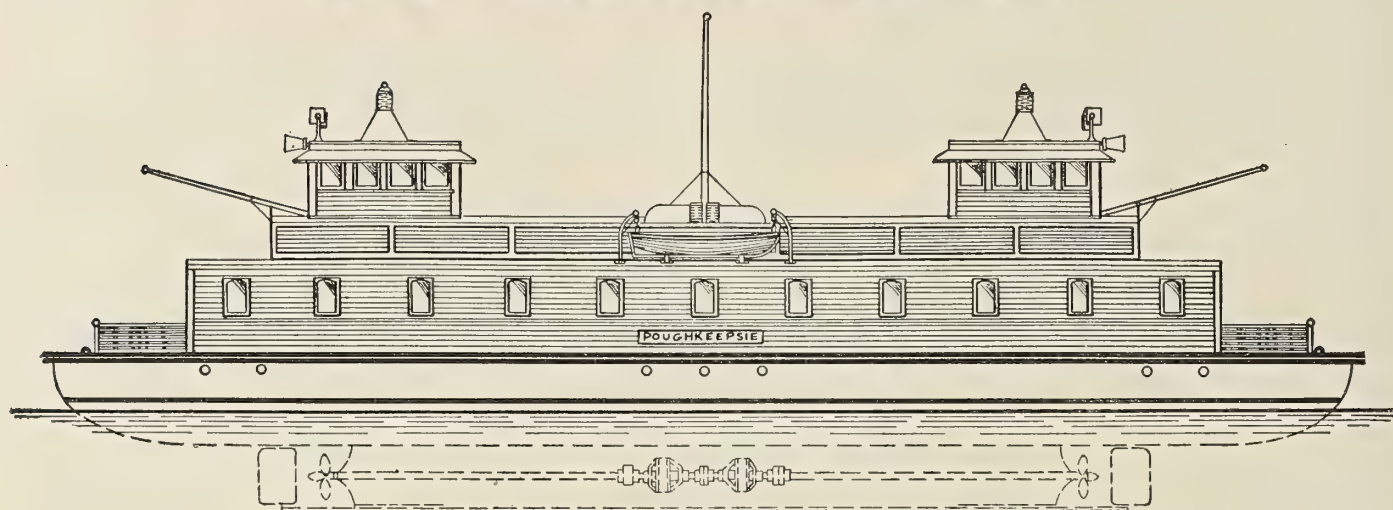
Union Tackle Blocks



UNION HARDWARE COMPANY
TORRINGTON, CONN.

NEW YORK OFFICE - 99 CHAMBERS ST.

Winton



A DIESEL-ELECTRIC DRIVE FERRY BOAT

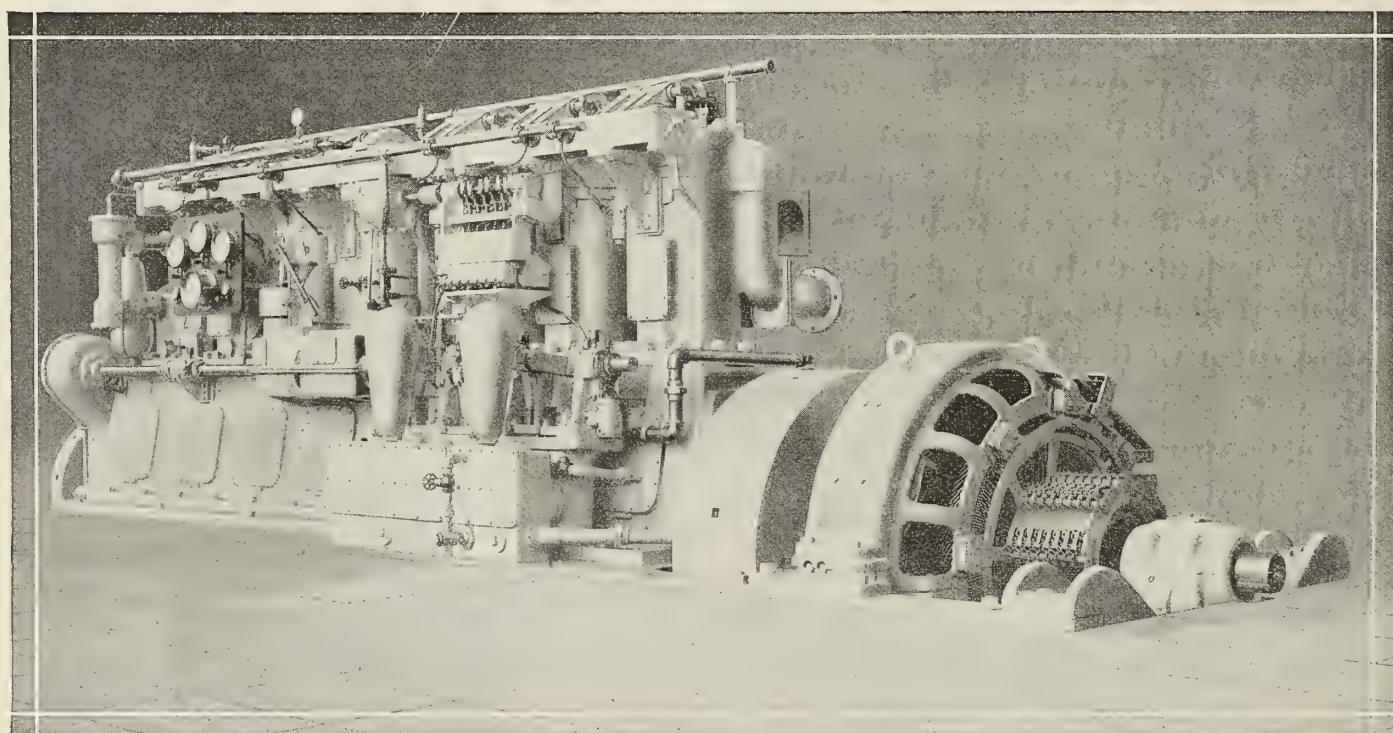
The Ferry-Vessel "Poughkeepsie" now under construction at the Atlantic Gulf & Pacific Company's Yard, Brooklyn, N. Y., for the Poughkeepsie and Highland Ferry Company is 140' over guards, 137' 6" over-all, 52' breadth over guards. Designs by C. V. S. Wyckoff.

Power plant consists of a pair of six cylinder 150 H.P. Winton Oil Engines direct connected to 90 K.W. Westinghouse Generators, which in turn operate two 100 H.P. Westinghouse electric motors on the double-ended propeller shaft. Capacity for 32 automobiles, in addition to usual cabin facilities.

Winton Diesel Electric Drive is THE Modern Power Plant

WINTON ENGINE WORKS

Cleveland, Ohio



Keep our Ships on the Seven Seas under the Stars and Stripes

Key number beside ship's name indicates operator shown bottom of column.

EUROPE

**Plymouth, Boulogne and London
From New York**

December 15—Centennial State (159).
December 27—Panhandle State (159).

**Bremen and Danzig
From New York**

December 31—Potomac (159).
December 3—Hudson (159).
December 10—Princess Matoika (159).

**Plymouth, Cherbourg and Bremen
From New York**

January 3—America (159).
December 8—January 17—George Washington (159).

SOUTH AMERICA

**Rio de Janeiro, Montevideo and
Buenos Aires
From New York**

December 7—Aeolus (91).
December 22—Huron (91).

FAR EAST

**Honolulu, Yokohama, Kobe, Shanghai,
Manila, Hongkong**

From San Francisco

December 17—Hoosier State (105).
January 14—Golden State (105).
February 7—Empire State (105).
March 4—Hoosier State (105).
March 25—Golden State (105).
April 19—Empire State (105).
May 13—Hoosier State (105).

**Yokohama, Kobe, Shanghai, Hong-
kong, Manila**

From Seattle

December 10—Pine Tree State (106).

**HAWAII, PHILIPPINES, EAST
INDIA**

**Honolulu, Manila, Saigon, Singapore,
Colombo, Calcutta**

From San Francisco

December 19—Creole State (105).
January 15—Wolverine State (105).

COASTWISE AND HAWAII

**Havana, Canal, Los Angeles, San
Francisco and Hawaiian Islands**

December 3—Hawkeye State (80).
January 7—Buckeye State (80).
February 11—Hawkeye State (80).

80 Matson Navigation Co.
120 Market St.,
San Francisco, Cal.
26 South Gay St., Baltimore, Md.
91 Munson Steamship Line.
67 Wall St., New York.
Tel. Bowling Green 3300.
105 Pacific Mail S. S. Co.
10 Hanover Sq., New York.
Tel. Bowling Green 4630.
621 Market St., San Francisco, Cal.
106 The Admiral Line.
17 State St., New York.
Tel. Bowling Green 5625.
L. C. Smith Bldg., Seattle, Wash.
159 United States Lines.
45 Broadway, New York.
Tel. Whitehall 2050.

U.S. SHIPPING BOARD
Washington, D.C.

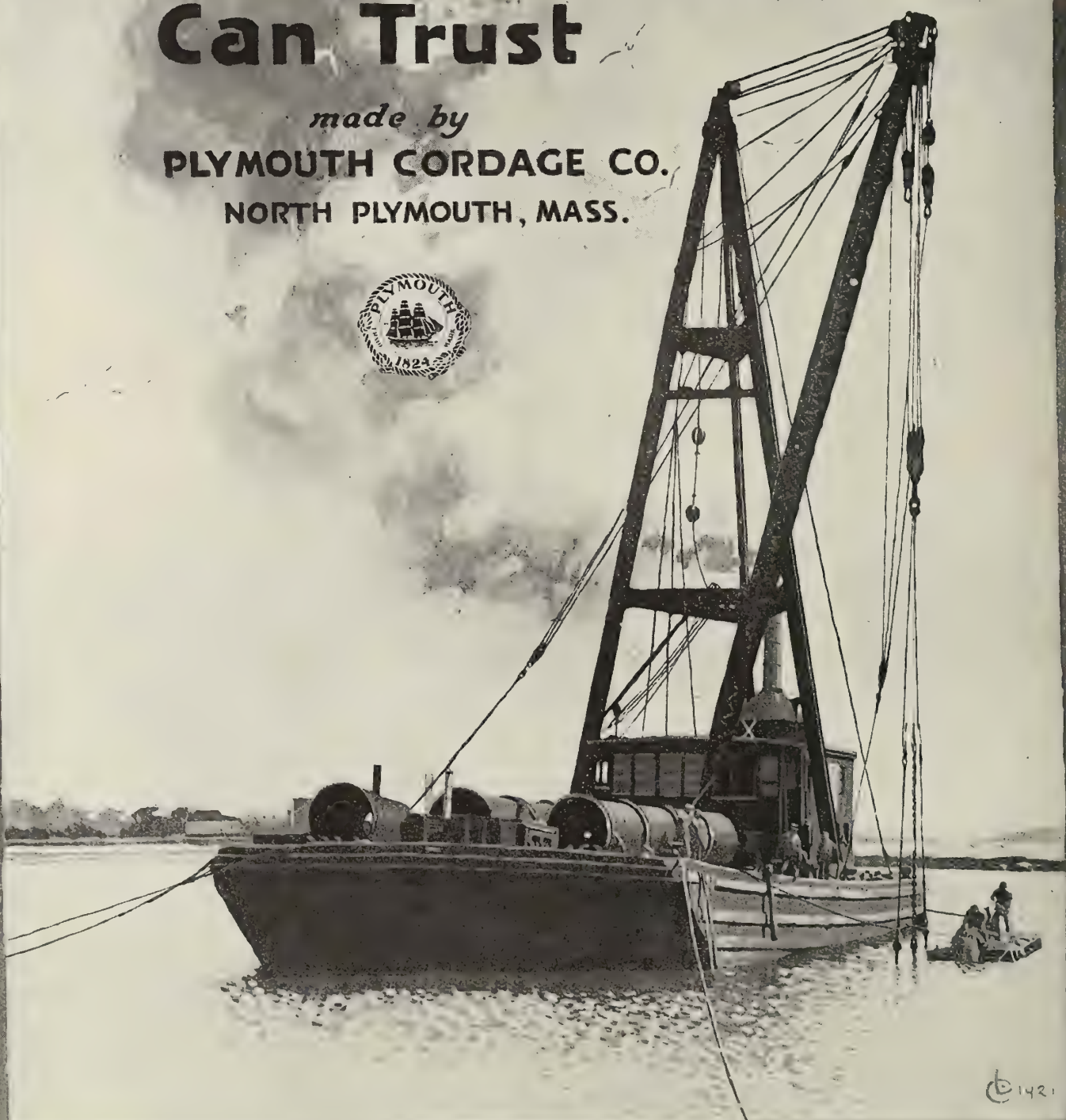


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TRAFFIC DEPARTMENT, U. S. SHIPPING BOARD EMERGENCY FLEET CORPORATION, WASHINGTON, D. C.**

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The Rope You Can Trust

made by
PLYMOUTH CORDAGE CO.
NORTH PLYMOUTH, MASS.





"NATIONAL" PIPE

IS WORKABLE PIPE

The modern processes used in the manufacture of "NATIONAL" Pipe tend primarily to produce durability and dependability in the product, but they also result in practical working advantages for those who install ship piping.

"NATIONAL" Pipe is exceptionally workable, because, among other things, it is uniform and strong; is sound in wall and weld; is clean and smooth, inside and out; and, being homogeneous and ductile, gives clean, strong threads and good bends.

Ask for "National" Bulletin No. 9

"NATIONAL" PIPE FOR SHIPBUILDING PURPOSES



NATIONAL TUBE COMPANY, PITTSBURGH, PA.

General Sales Offices: Frick Building

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BUY IT FROM THE NAVY

Naval Vessels as Hulks for Salvage

By Sealed Proposals opening January 16, 1922
At Board of Survey, Appraisal and Sale,
Navy Yard, Washington, D. C.

Improvements in Naval construction have rendered these fine old warships obsolete, and the opportunity is now being given the metal trades to purchase for salvage the following vessels:—

Some of the Vessels Offered for Salvage

(Note.—Displacement given below is for full load.)

- | | |
|---|--|
| U. S. S. MAINE (Battleship). Built in 1901.
Length, 393 feet; draft, 23 feet; beam, 72 feet.
Displacement, 13,500 tons. Now at Philadelphia, Pa. | U. S. S. OZARK (Monitor). Built in 1900.
Length, 255 feet; draft, 13 feet; beam, 50 feet.
Displacement, 3,356 tons. Now at Philadelphia, Pa. |
| U. S. S. MISSOURI (Battleship). Built in 1901.
Length, 394 feet; draft, 24 feet; beam, 72 feet.
Displacement, 13,500 tons. Now at Philadelphia, Pa. | TARGET (Ex-Monitor MIANTANOMOH).
Built in 1876.
Length, 263 feet; draft, 14 feet; beam, 55 feet.
Displacement, 3,990 tons. Now at Norfolk, Va. |
| U. S. S. WISCONSIN (Battleship). Built in 1898.
Length, 374 feet; draft, 24 feet; beam, 72 feet.
Displacement, 12,150 tons. Now at Philadelphia, Pa. | U. S. S. TONOPAH (Monitor). Built in 1900.
Length, 255 feet; draft, 13 feet; beam, 50 feet.
Displacement, 3,356 tons. Now at Philadelphia, Pa. |
| *U. S. S. BROOKLYN (Cruiser). Built in 1895.
Length, 402 feet; breadth, 65 feet; draft, 24 feet.
Displacement, 10,068 tons. Now at Mare Island, Cal. | *U. S. S. SMITH (Destroyer). Built in 1909.
Length, 294 feet; draft, 8 feet; beam, 26 feet.
Displacement, 902 tons. Now at Philadelphia, Pa. |
| *U. S. S. COLUMBIA (Cruiser). Built in 1892.
Length, 504 feet; draft, 25 feet; beam, 73 feet.
Displacement, 15,712 tons.
Now a wreck at Santo Domingo, D. R. | *U. S. S. ALBERT BROWN (Fish Boat).
Built in 1897.
Length, 103 feet; draft, 10 feet; beam, 18 feet.
Gross tonnage, 108 tons. Now at Philadelphia, Pa. |
| U. S. S. MEMPHIS (Cruiser). Built in 1903.
Length, 413 feet; draft, 23 feet; beam, 58 feet.
Displacement, 7,387 tons. Now at Philadelphia, Pa. | U. S. S. ORIOLE (Ex-DALE); Wooden Sailing Vessel. Built in 1839.
Length, 117 feet; beam, 34 feet.
Now at Coast Guard Depot (S. Baltimore, Md.). |
| TARGET (Ex-Monitor PURITAN). Built in 1882.
Length, 299 feet; draft, 18 feet; beam, 60 feet.
Displacement, 6,060 tons. Now at Norfolk, Va. | |

NOTE—The vessels marked with an asterisk (*) will on December 15, 1921, be offered for sale for "Conversion to Commercial Uses." Such vessels as are not sold on that date will be offered on January 16, 1922, for sale as "Hulks for Salvage."

The offer of these vessels by the Navy Department for sale to commercial organizations should be considered from the standpoint of a nucleus to go into the ship breaking up field for some "*farsighted concern*" looking for new business.

Aside from the ferrous and non-ferrous metals entering into Naval ship construction, consider the electrical machinery, pumps, winches, boilers, engines, piping, etc., for which there is always a receptive market with an attractive recovery.

A careful investigation of the success recently achieved in foreign countries by "*Ship breaking*" concerns will convince you of the advisability of promptly communicating with the Navy Department.

Write or wire for catalog No. 21-46b giving the terms of sale and describing the vessels offered

CENTRAL SALES OFFICE

NAVY DEPARTMENT

WASHINGTON, D. C.

Air Compressors

Efficiency at Full and Partial Loads

The volume of air required will vary with your production and it is hardly possible to predict what this will be at all times. The question, therefore, comes down to the installation of an air compressor which not only meets your maximum requirements, but also operates efficiently at partial loads.

Class "PRE" direct-connected electric motor driven compressors are regulated by the 5-step Clearance Control which causes the compressor to operate at any one of the *five different load points*, depending upon the demand for air.

With this Control, the Class "PRE" Compressor will deliver *full, three-quarter, one-half, one-quarter or none of its capacity*, and the horsepower required will be practically in proportion to the air output.

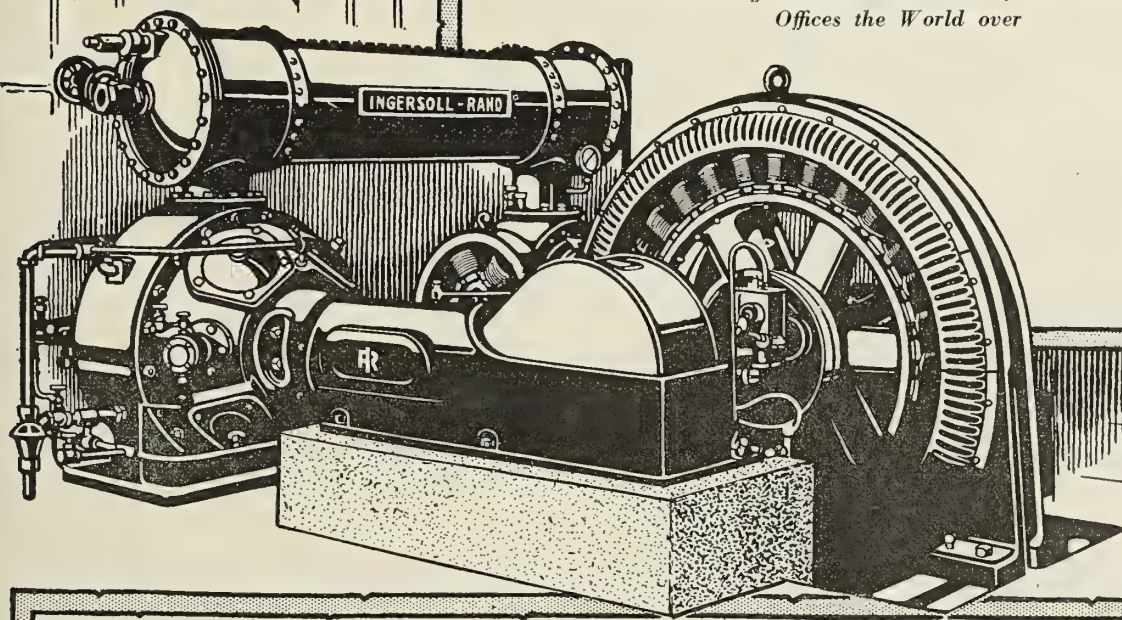
The Clearance Control is entirely automatic, being governed by a predetermined variation in air receiver pressure.

We will be glad to tell you more about class "PRE" Compressors. Meanwhile, request Bulletin 3126 which describes these machines in detail.

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582-C

Ingersoll-Rand



MAJESTIC
WORLD'S LARGEST
STEAMSHIP

De Laval Oil Purifiers will protect her machinery and economize on oil

The new White Star liner Majestic displaces 56,000 tons, develops 91,000 horsepower, and will easily maintain a speed of 26 knots under favorable weather conditions. Her builders are insuring her machinery by installing De Laval Oil Purifiers to maintain the purity of her lubricating oil.

They know that besides giving her machinery longer life, the De Laval Oil Purifiers will quickly pay for themselves by the saving of oil they effect. On the Majestic it will never be necessary to pump used oil overboard. Instead, after each period of use it will be passed through the De Laval Oil Purifiers and returned to the lubricating system with its efficiency equal to new.

De Laval Oil Purifiers are protecting the vital parts of more than 700 marine power plants. More than 300 of them are used on U. S. naval vessels alone, where they have proved their ability to stand up under the most severe service conditions.

De Laval Bulletins Nos. 102 and 103 tell how you can safeguard machinery and save oil on your ships by the De Laval Method. Write for them.

The De Laval Separator Company

New York, 165 Broadway

Chicago, 29 East Madison St.

De Laval Steam Turbine Company

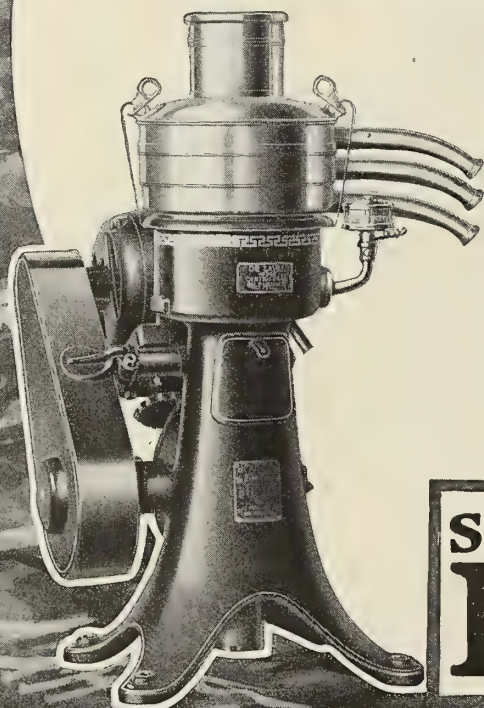
De Laval Pacific Company

Trenton, N. J.

San Francisco, Cal.

Chadburn's (Ship) Telegraph Company, Ltd., Cyprus Road, Bootle, Liverpool,

Turbine Equipment Company, Toronto, Ontario, Canada.



Sooner or later you will use a
De Laval

—LESS TAPS—
MORE HOLES PER TAP
WHEN
BRUBAKERS
ARE USED

BRUBAKER quality is not a matter of chance—it is a scientific certainty, every time.

Special machinery insures accurate pitch and correct relief. Improved methods of heat treating mean uniform and serviceable temper.

Then thorough inspection practically eliminates the possibility of defective taps getting into stock.

That's why Brubaker Taps tap 20% more holes per tap—cut faster and cleaner than the average tap. Your next requisition specify "Brubaker."

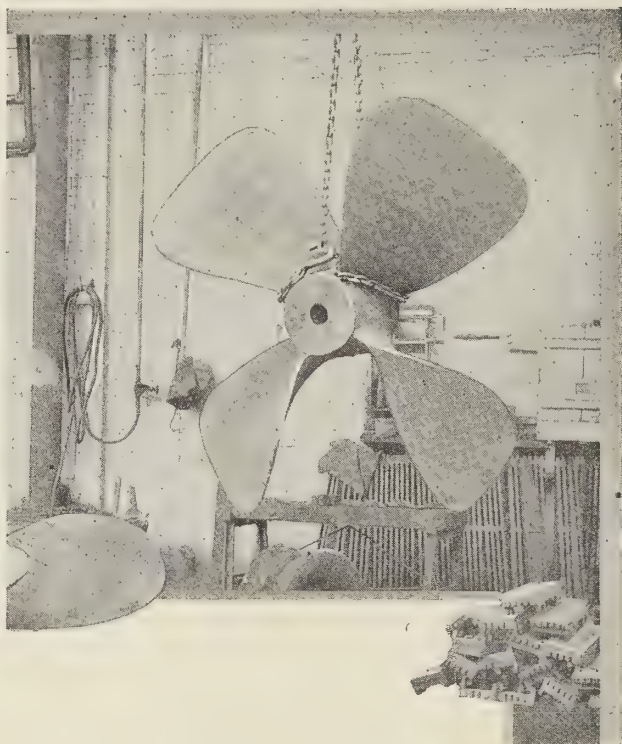
W. L. BRUBAKER & BROS. CO.

50 CHURCH STREET

NEW YORK

Factory at Millersburg, Pa.





Order that spare wheel or blade NOW!

Don't take any chances on a tie up from a broken wheel or blade. Get that "spare" now.

The Ferguson Herbert Corp'n is keen to help you—ready to ship you cast iron or bronze wheels—spare blades on emergency call.

Take advantage of Ferguson-Herbert direct foundry and machine shop service—and the shipping facilities offered by the strategic position of their shops—at Hoboken, N. J.

**Furnace Fittings
Bronze and iron castings
Shafting and liners**

CALL CORTLAND 3415

Ferguson-Herbert Corp.

JOHN FERGUSON—FREDERICK D. HERBERT

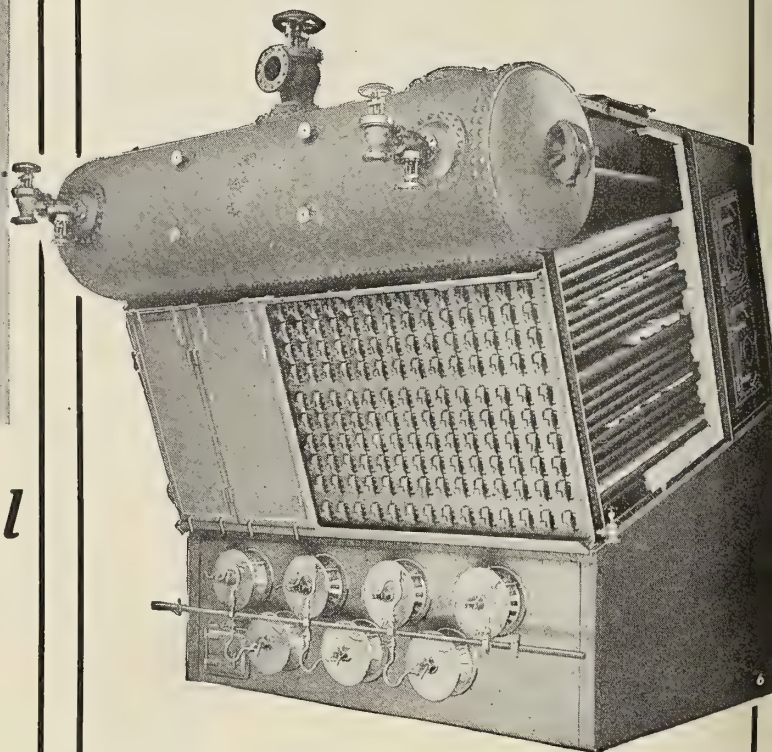
Foundry and Machine Shop

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K-51

What are the advantages of the Ward Watertube Boiler?



A fair question easily answered :

Low first cost	Evaporates
Low installation cost	17 lbs. of water to 1 lb. of oil
Low upkeep cost	Straight seamless tubing only
Positive circulation	No nipple connections
Rapid evaporation	No staybolts

These are the reasons why Ward Boilers are in use today on many ships of the U. S. Navy, the U. S. Shipping Board and many commercial lines.

Would you like us to tell you full particulars about the Ward Boiler? Write now.

**The Charles Ward En'g. Works
Charleston, W. Va.**

Eastern Agent

Kearfott Engineering Co., Inc.
95 Liberty St., New York, N. Y.

LUNKENHEIMER

"Victor" Gate Valves

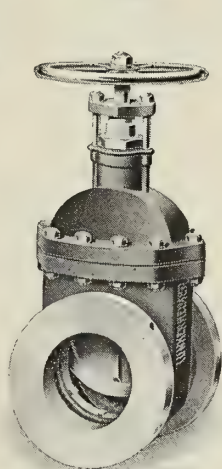


Fig. 941.
Iron Body Bronze Mounted.
For pressures up to 125 lbs.

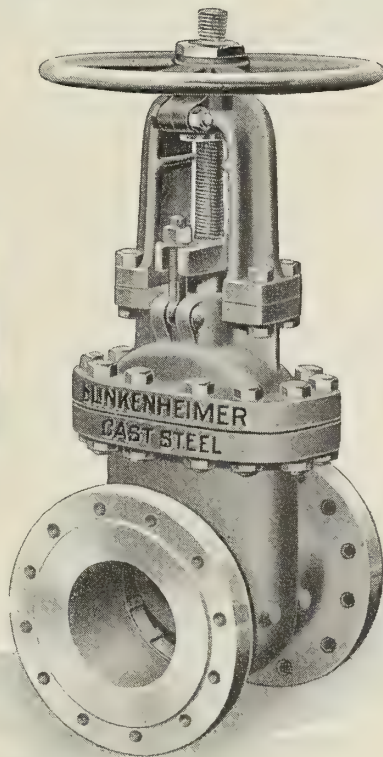


Fig. 1353
Cast Steel. For pressures up to 350 lbs.

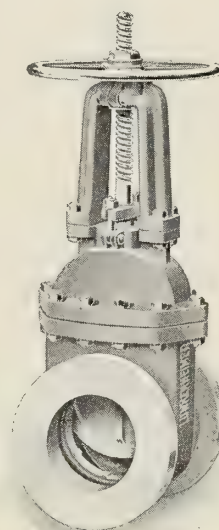


Fig. 787.
Bronze. For pressures up to 250 lbs.

Dependable performance is the service record of LUNKENHEIMER "VICTOR" GATE VALVES. The LUNKENHEIMER solid wedge disc, double-faced and guided in its travel, is the most practical design of Gate Valve construction. It eliminates "dragging" across the seating faces and the consequent wear prevalent in valves employing loose parts.

Highest quality materials, coupled with the LUNKENHEIMER method of manufacture; bearings bushed to minimize wear; all parts, including the seatings renewable, and the indestructible gasket between the bonnet and body flanges, all tend to enhance their value and insure longevity.

LUNKENHEIMER "VICTOR" Gate Valves are made in Bronze for pressures up to 125 and 250 pounds; in Iron Body Bronze Mounted for pressures up to 100, 125, 175 and 250 pounds, and in Cast Steel for pressures up to 350 pounds and temperature to 800° F. A complete line covering every service requirement.

LUNKENHEIMER Distributors situated in practically every port carry LUNKENHEIMER PRODUCTS in stock for immediate delivery. Specify LUNKENHEIMER and insist on getting what you specify.

THE LUNKENHEIMER CO.
— "QUALITY" —

LARGEST MANUFACTURERS OF
HIGH GRADE ENGINEERING SPECIALTIES
IN THE WORLD

NEW YORK CHICAGO CINCINNATI. U.S.A. BOSTON LONDON
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OF CATALOG BEARS
No 58
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Capacity of Shipyard— Eight Building Ways, Three Large Wet Docks



View of Three Wet Basins and New Dry-Dock.

**OUR NEW TEN THOUSAND TON FLOATING DRY DOCK NOW IN
SUCCESSFUL OPERATION!**

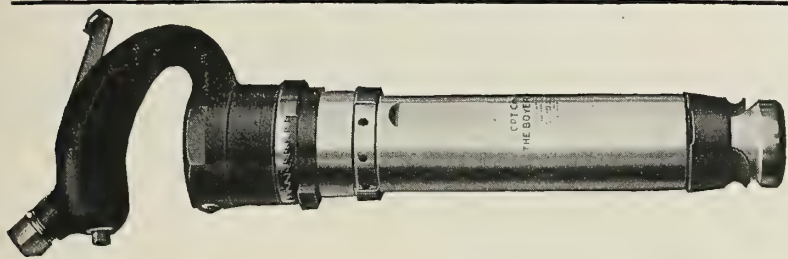
ENGINE BUILDERS—BOILER MAKERS—IRON FOUNDERS
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BUILDERS OF HIGH CLASS SINGLE AND TWIN SCREW PASSENGER AND CARGO
VESSELS, ALSO BULK OIL TANKERS, UP TO 600 FEET IN LENGTH

SUN SHIPBUILDING COMPANY

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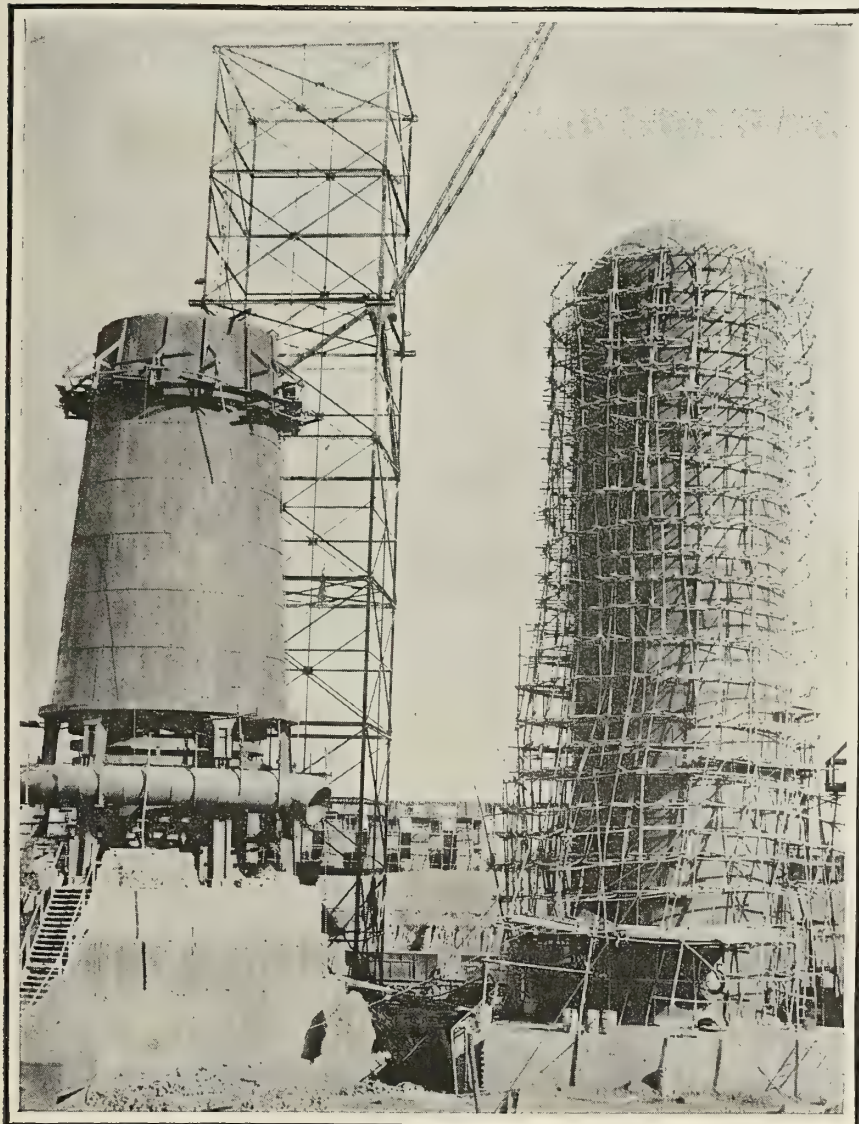
Boyer— the World's Standard

WHEN a native of India uses a Boyer Riveting Hammer—the merits of which he depends upon more than his skill—it is significant.

It signifies that under primitive conditions, where untold abuse of tools in the hands of unskilled labor makes dependability paramount—where a break-down would cause expensive delays—Boyers can be *relied upon*.

That is why Boyers were selected for erecting this steel blast furnace—a difficult job, where *certainty of performance, air and maintenance economy* were essential.

No matter how *exacting* the job or *where* located—select Boyers for it. Ask for Bulletin 810.



View shows Steel Blast Furnace erected by Arthur G. McKee & Company, Cleveland, for the Indian Iron & Steel Co., Asansol, India, near Calcutta. Native labor used.

Chicago Pneumatic Tool Company

Chicago Pneumatic Building • 6 East 44th Street • New York

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P143

BOYER PNEUMATIC HAMMERS • LITTLE GIANT PNEUMATIC AND ELECTRIC TOOLS
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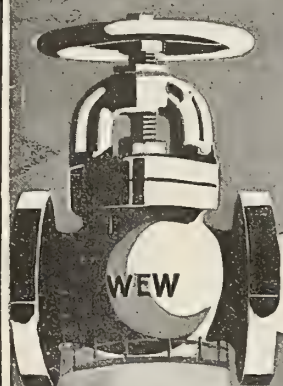
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HAMMERS

wherever rivets are driven



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Marine Equipment
Spells Safety

BRONZE — IRON — STEEL

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WILLIAM E. WILLIAMS VALVE CORP.

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MARINE MATERIAL**

Consists of Complete Equipments, Such as Valves, Fittings, Fire and Life Saving Apparatus, Wire and Manila Ropes and Hawsers.

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Steering Gear
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When You Buy A-E-CO Auxiliaries

you get more than a piece of machinery; more than so many pounds of metal; more than a name.

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You Get Experience

covering sixty years of designing and building marine auxiliaries, culminating in a definite knowledge of what to build and how to build it.

You Get Service

of a character that has no superior. A service that is constantly competing with itself.

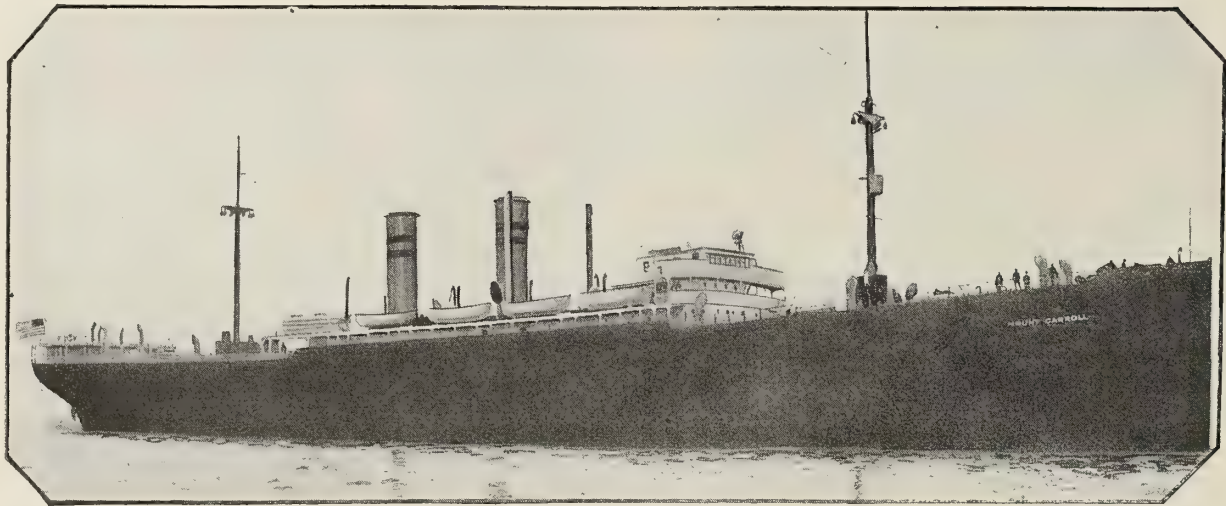
You Get Satisfaction

Ask for Catalogs

American Engineering Company

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S.S. Mt. Carroll, Combination Freight and Passenger ship built at the Merchant Yard for the Shawmut S.S. Company, and operated in the New York-Hamburg service by the United American Lines

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Every buyer of ships asks himself three principal questions:

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Will delivery be made on time?

Are specifications followed exactly?

We have been answering these questions for 62 years in the production of more than 300 vessels of all kinds.

This same quality service is also offered to those who are in the market for engineering or steel construction specialties, with a specialized technical staff readily available for consultation and helpful advice.

Our Quotations will interest you

MERCHANT

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Ask us to bid on the following:

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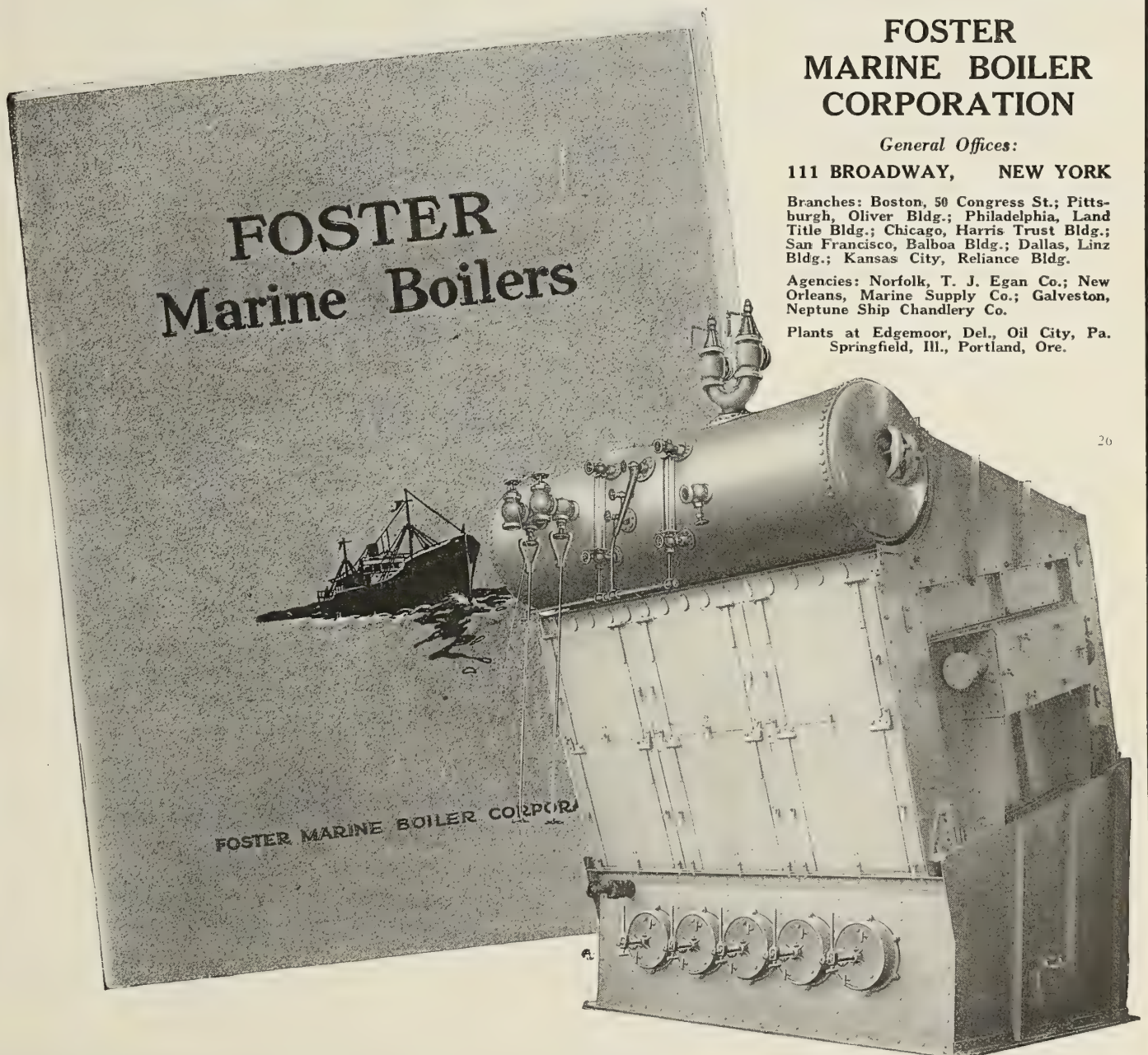
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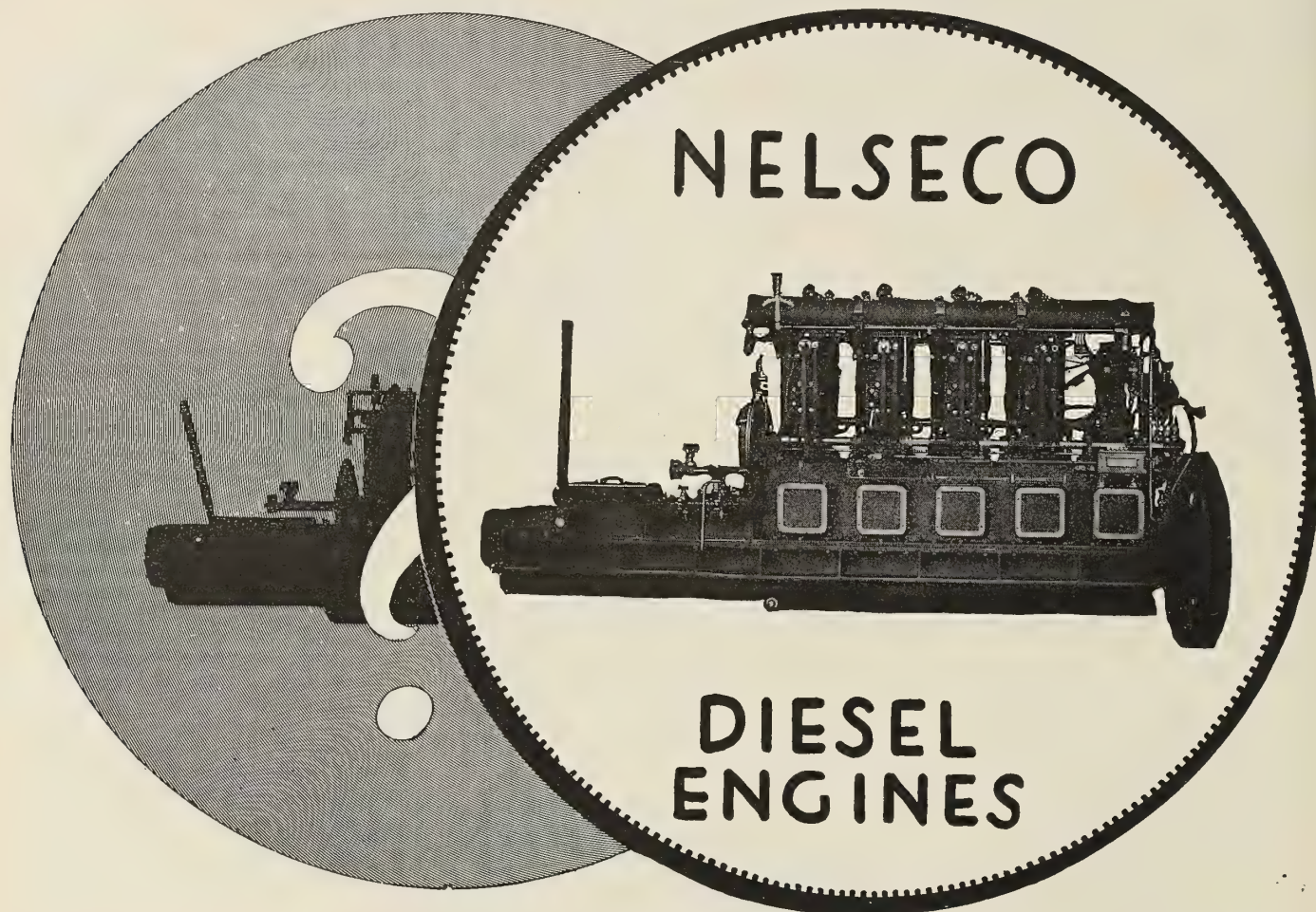
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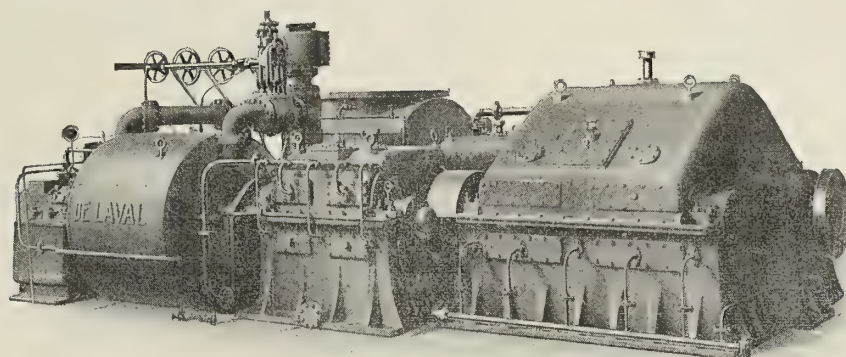
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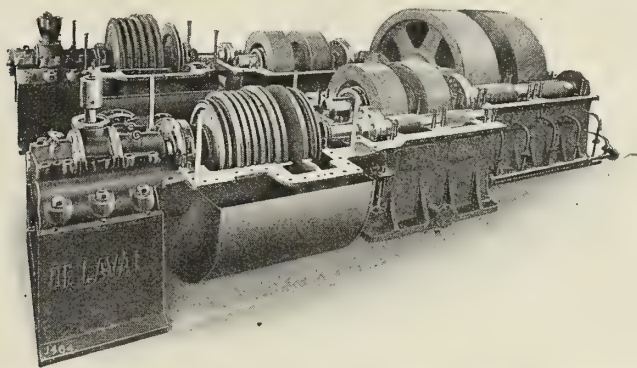
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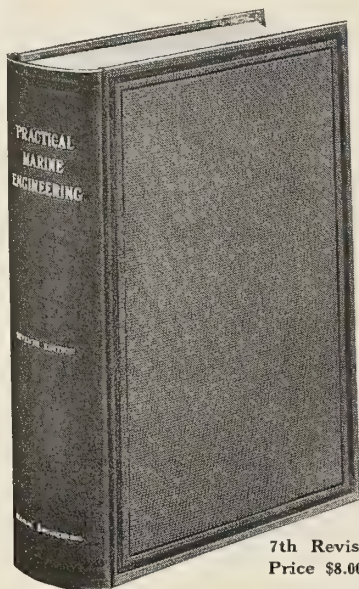
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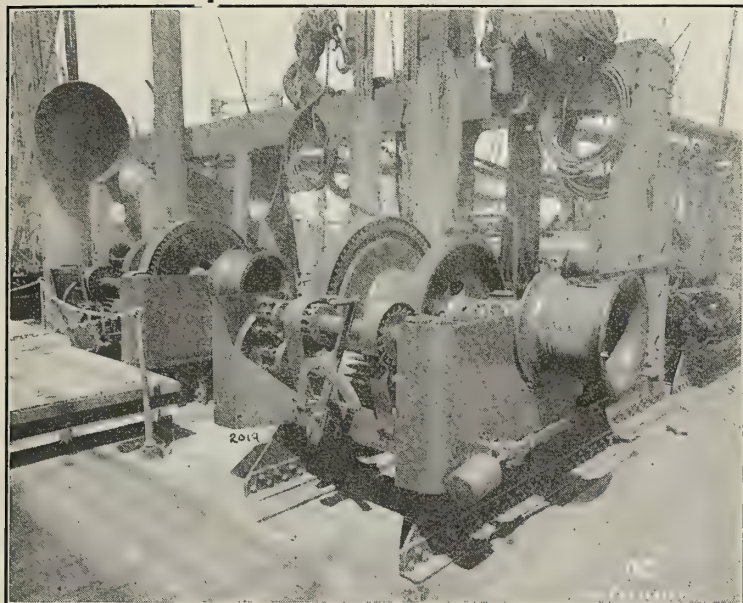


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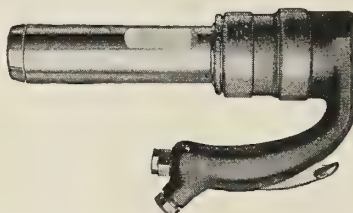
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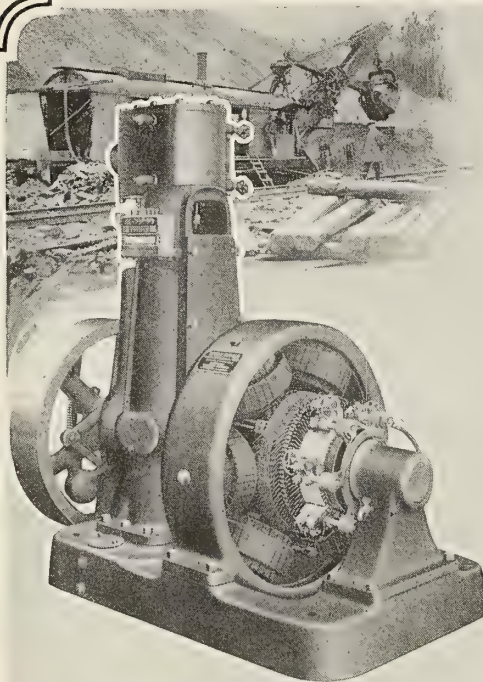
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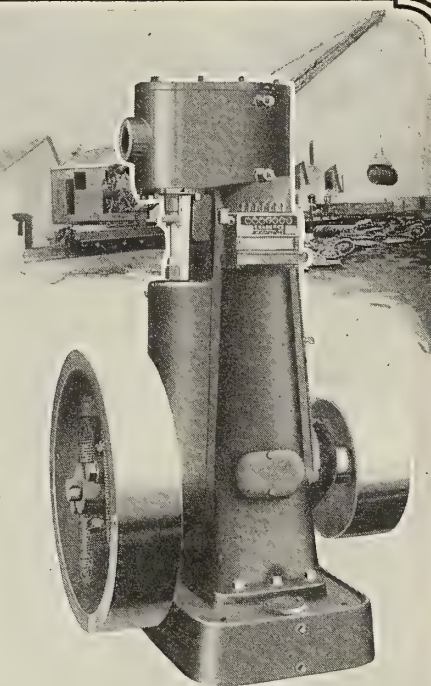
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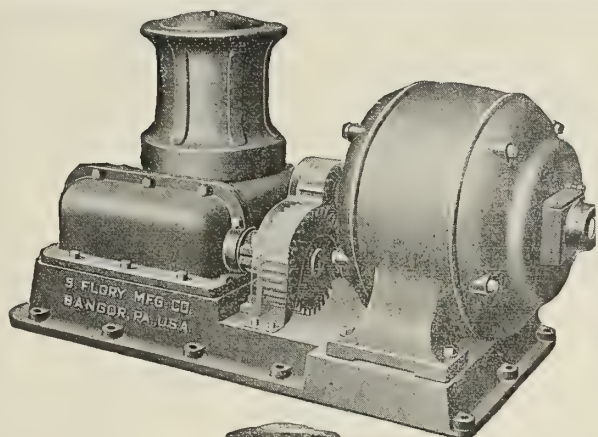
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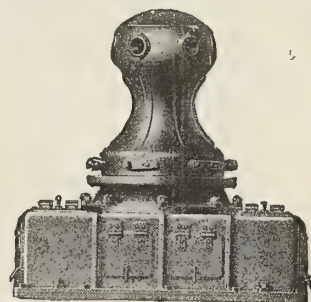
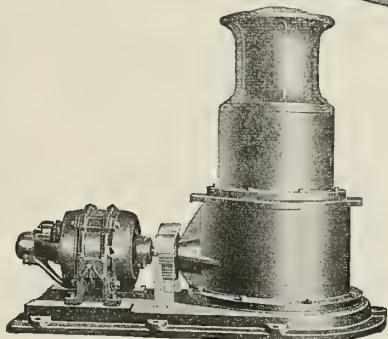
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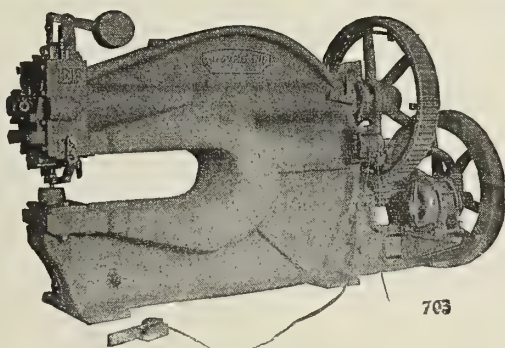
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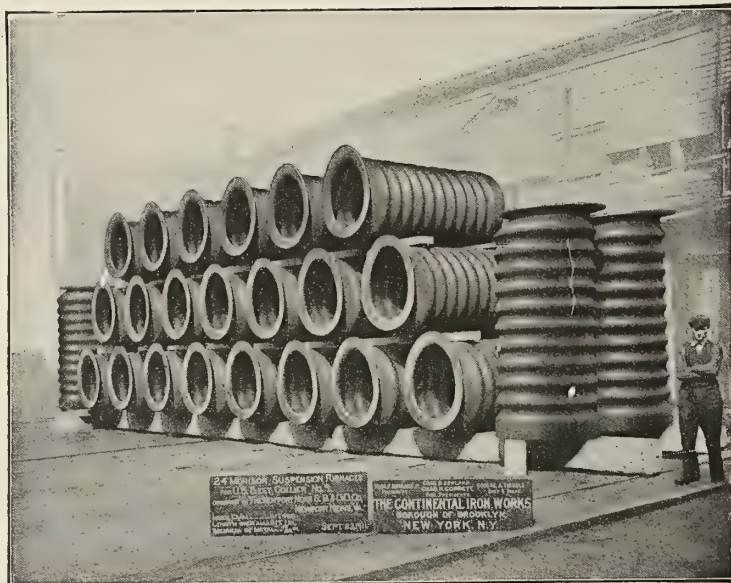
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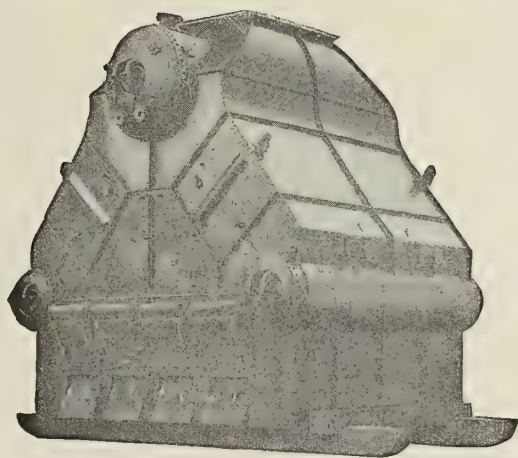
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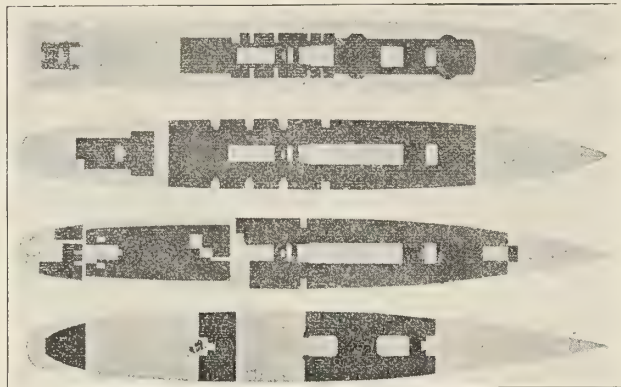
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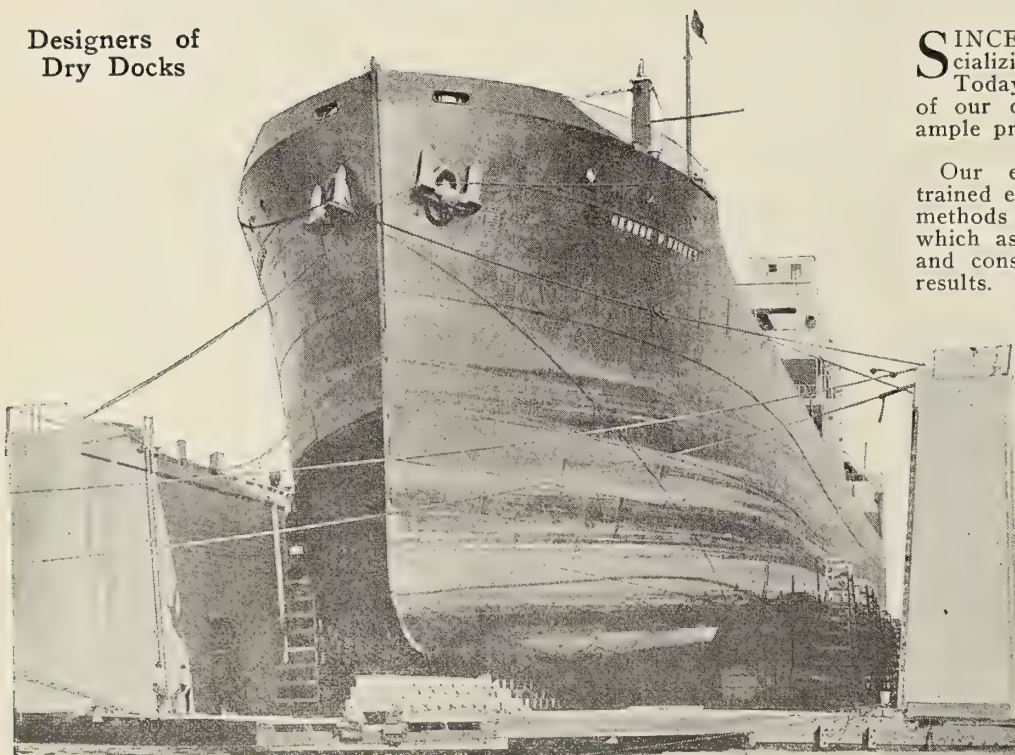
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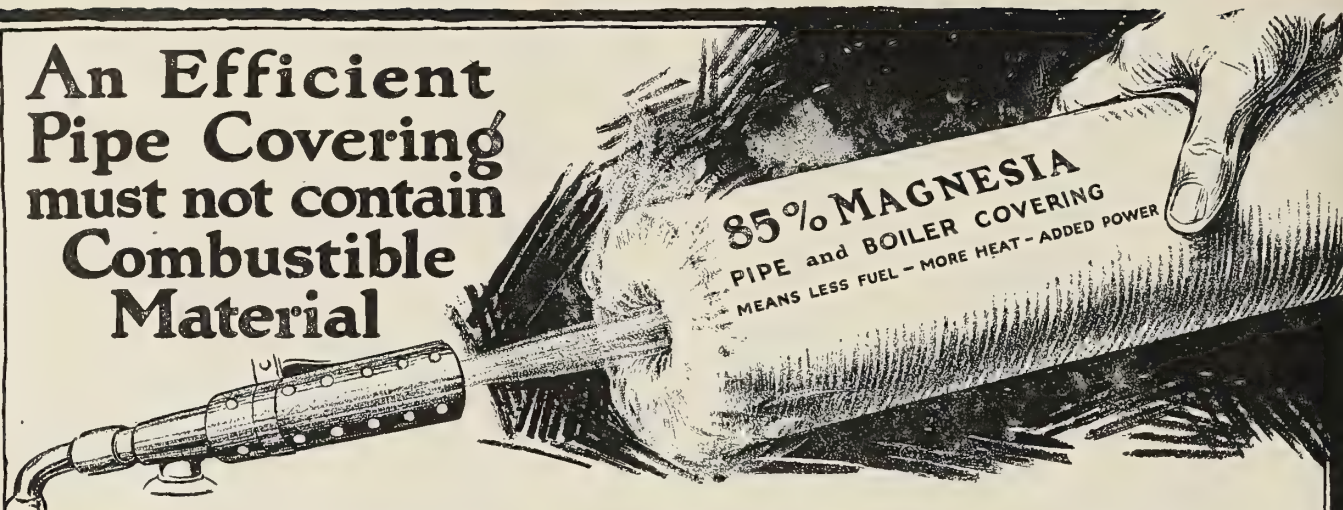
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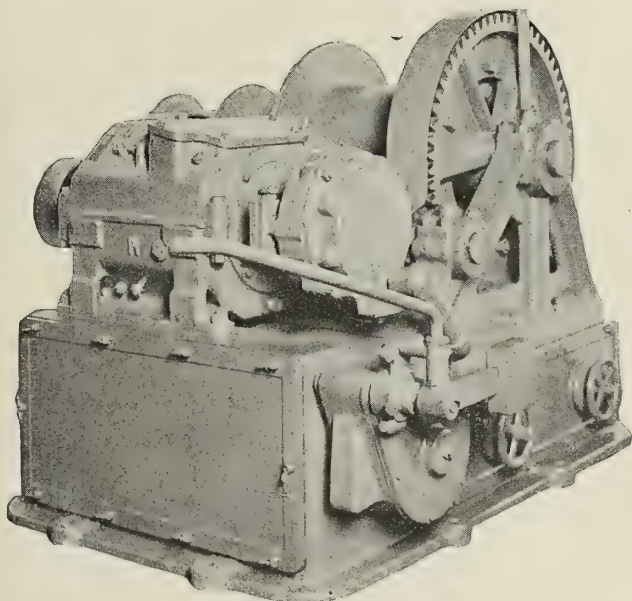
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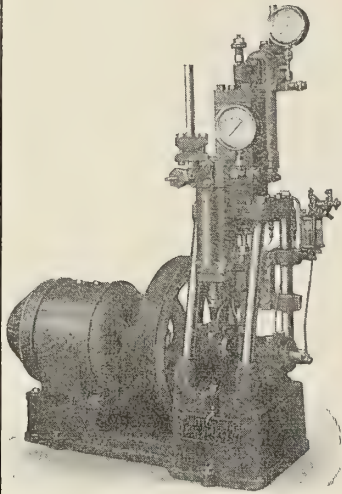
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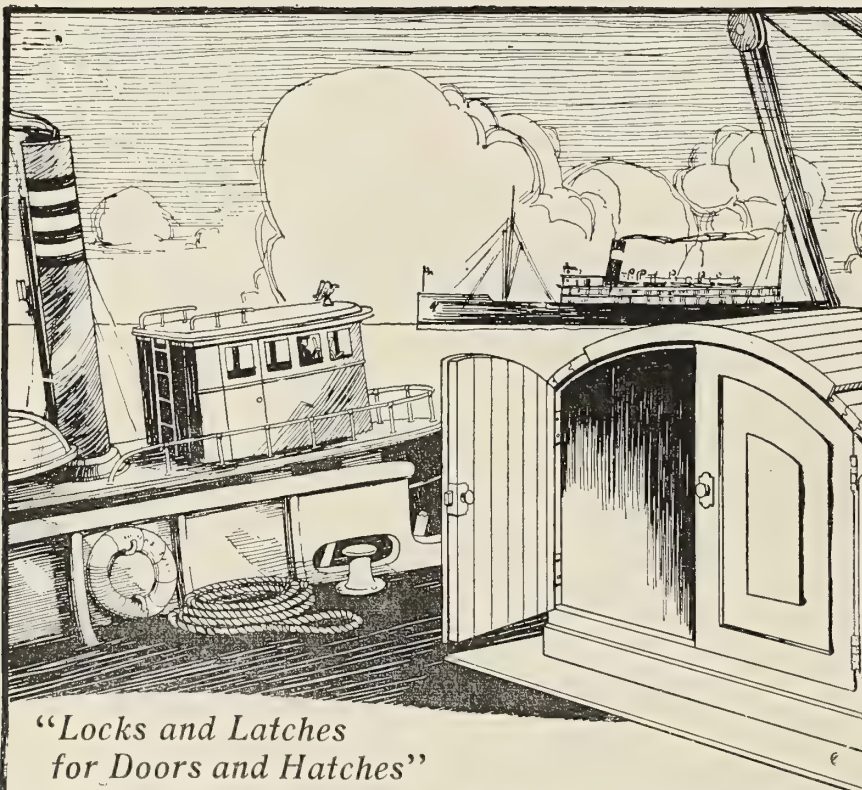
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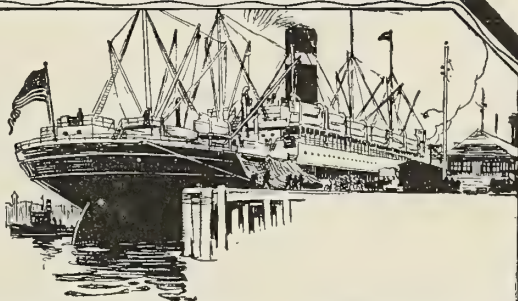
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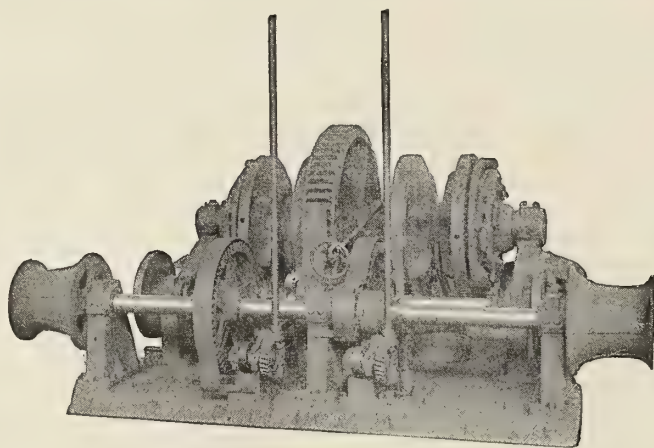
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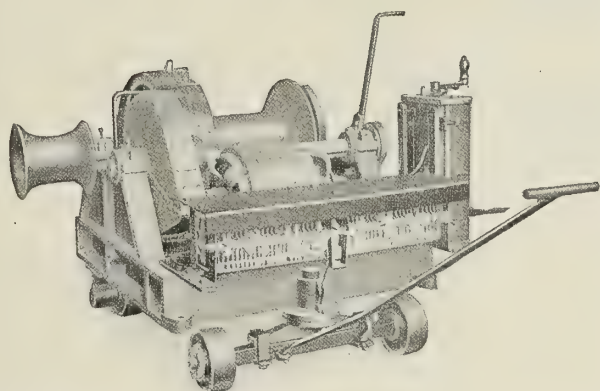
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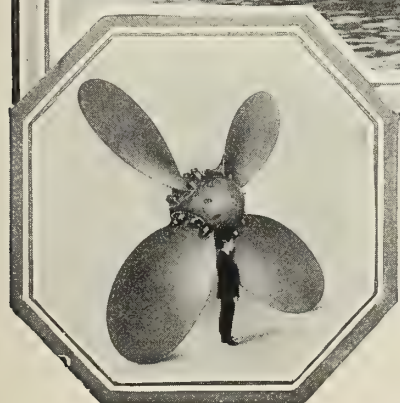
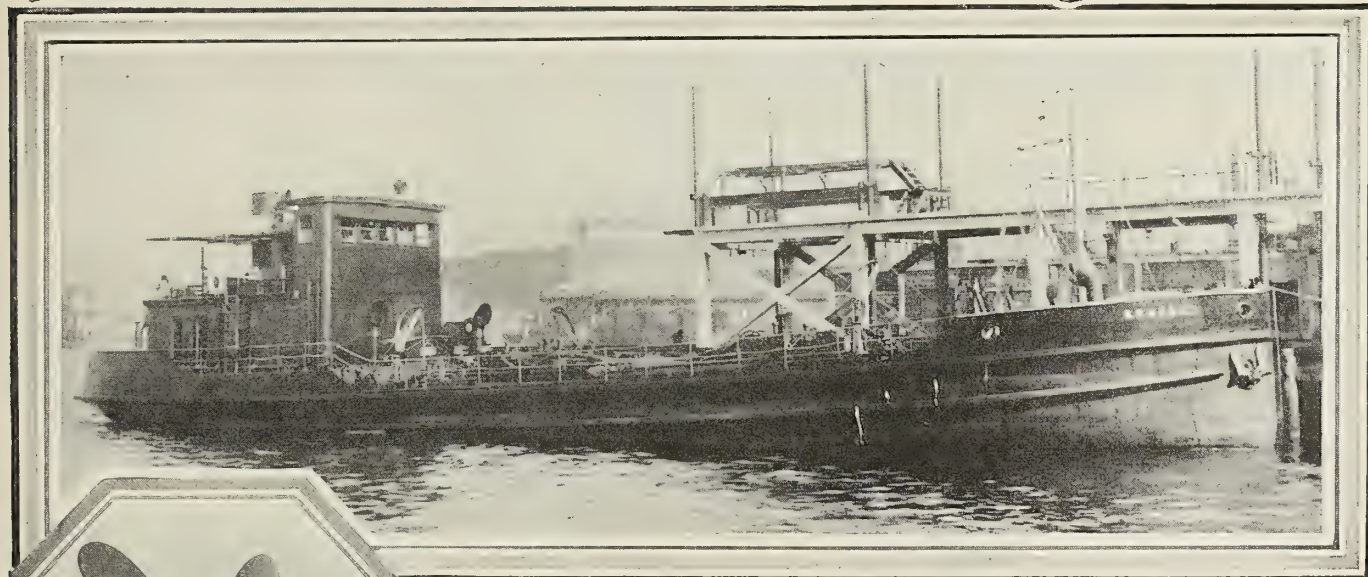
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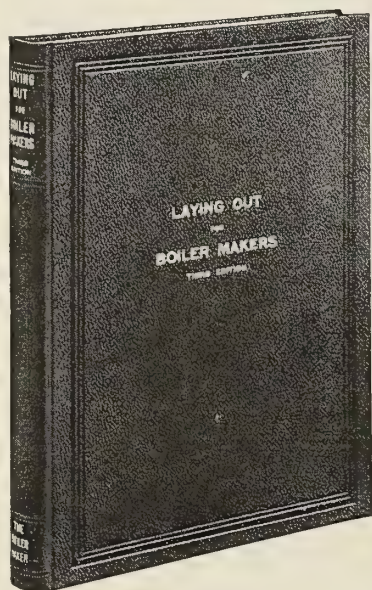
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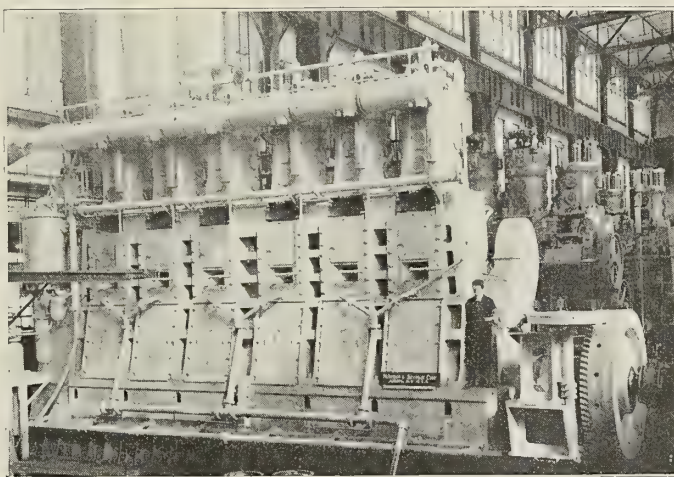
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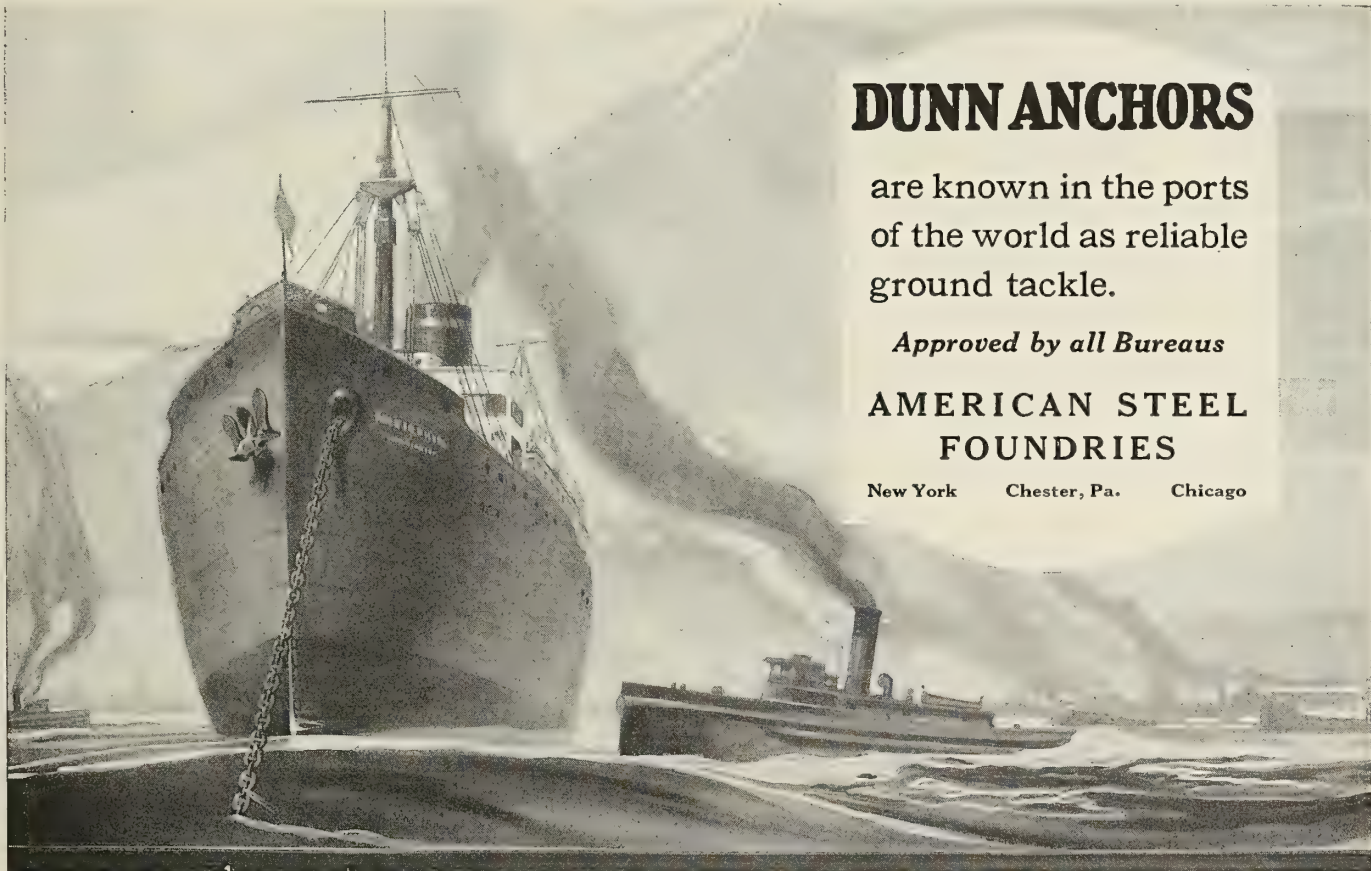
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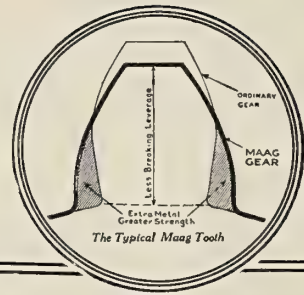
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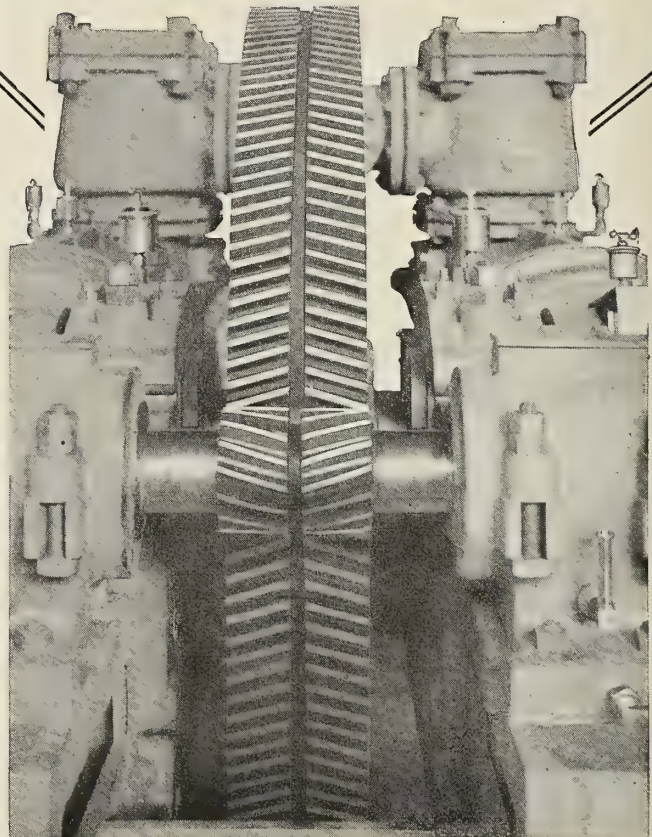
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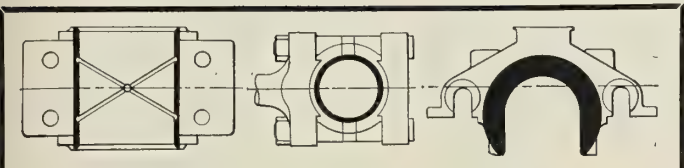
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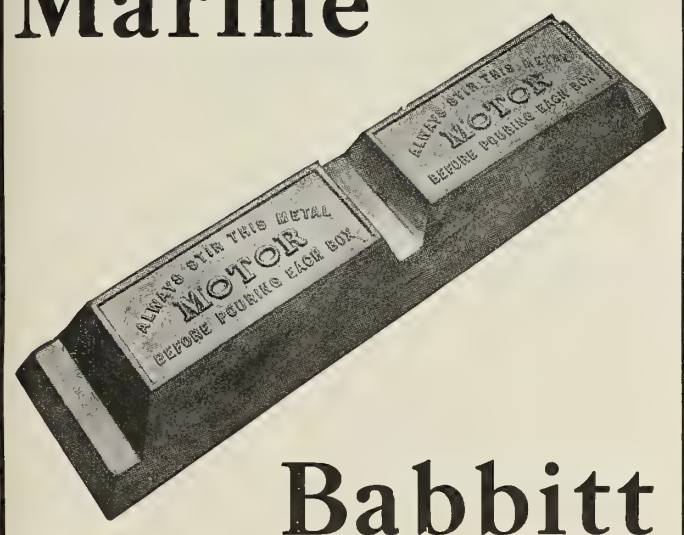
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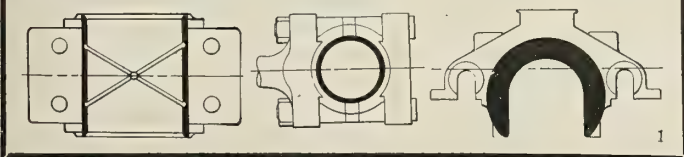
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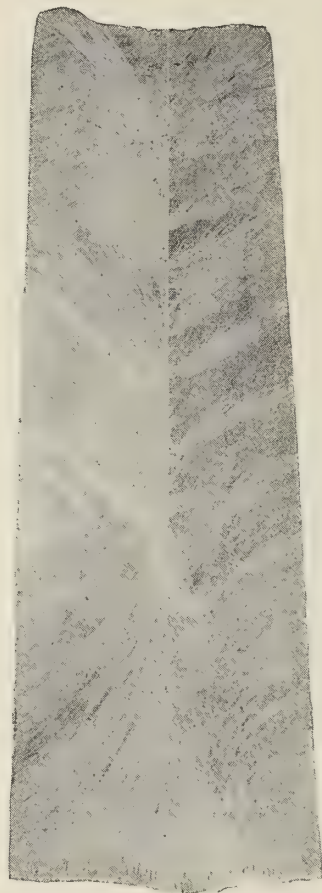
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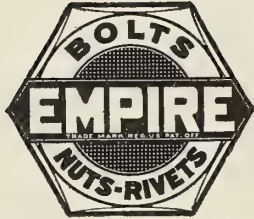
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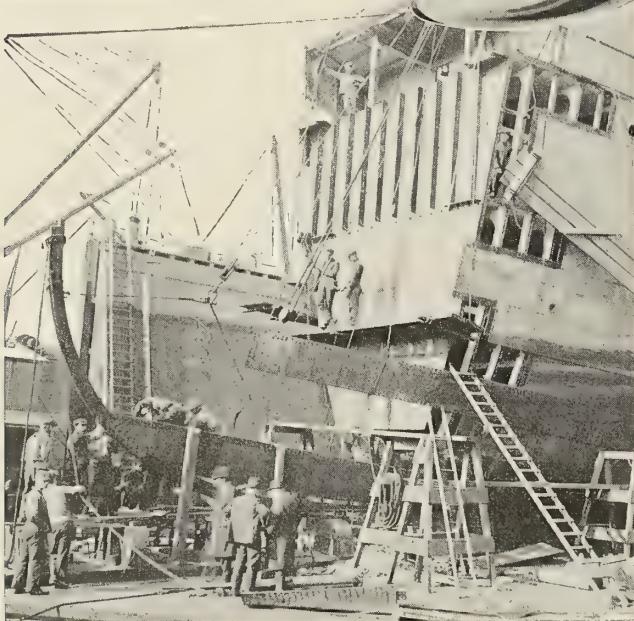


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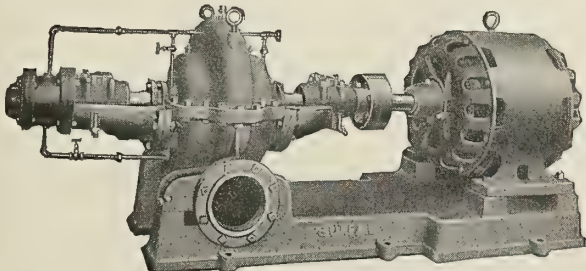
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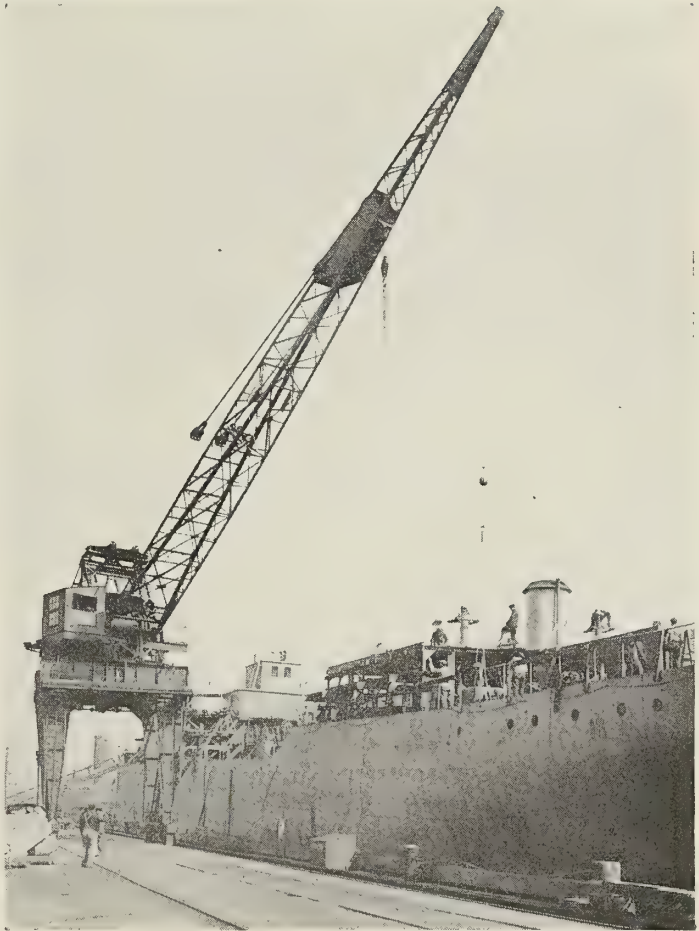
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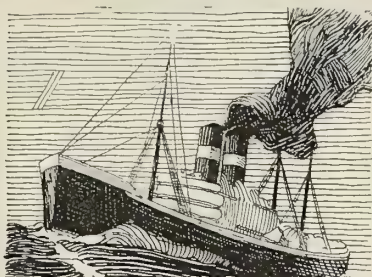
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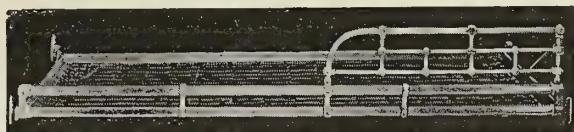
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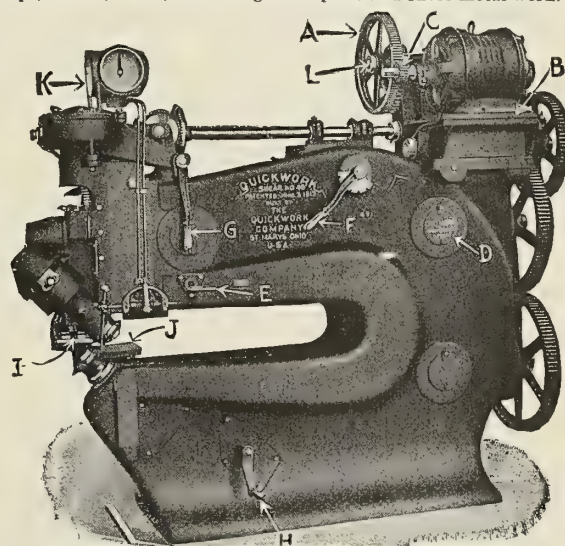
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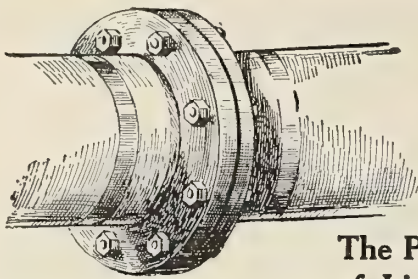
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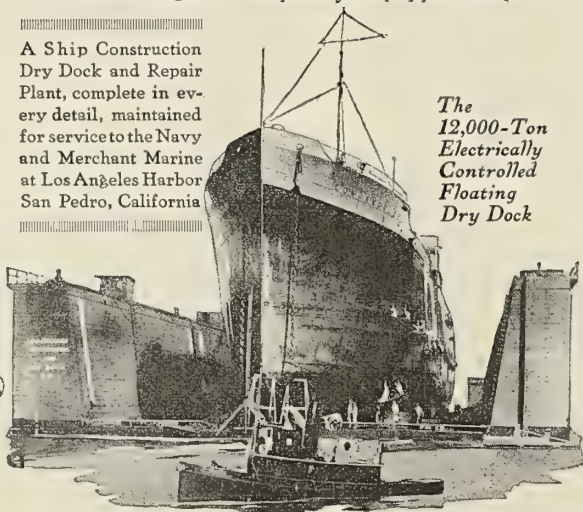
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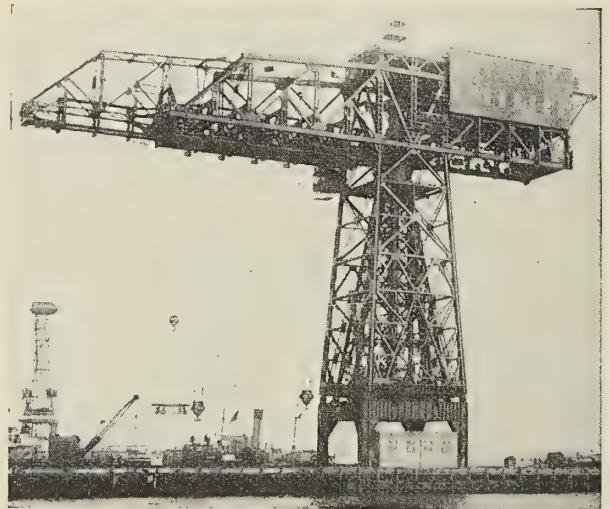
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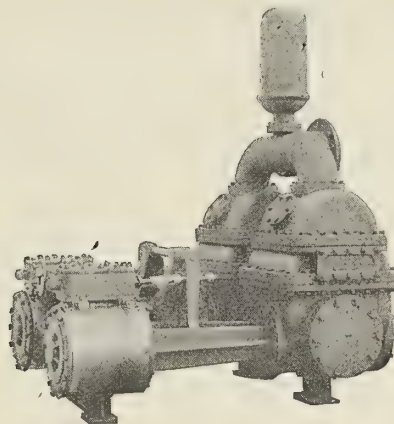
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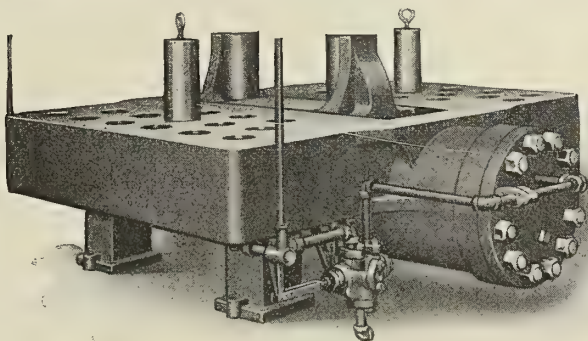
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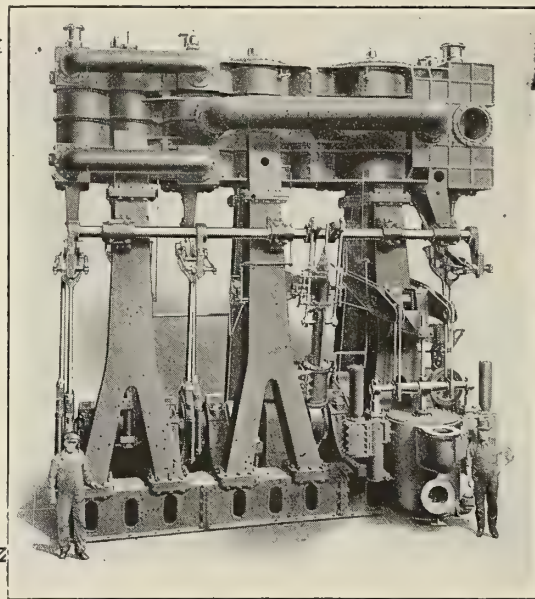
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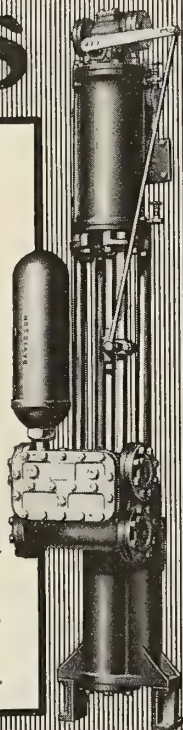
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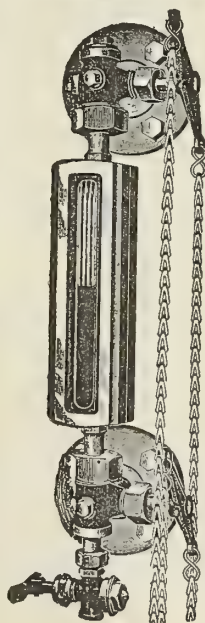
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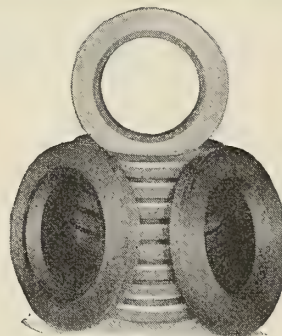
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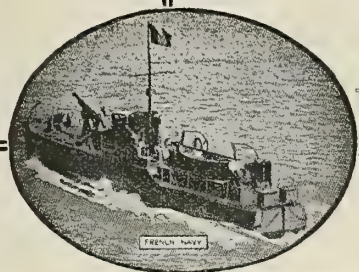
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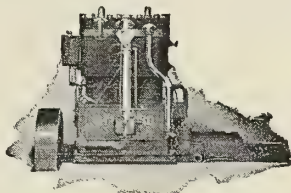
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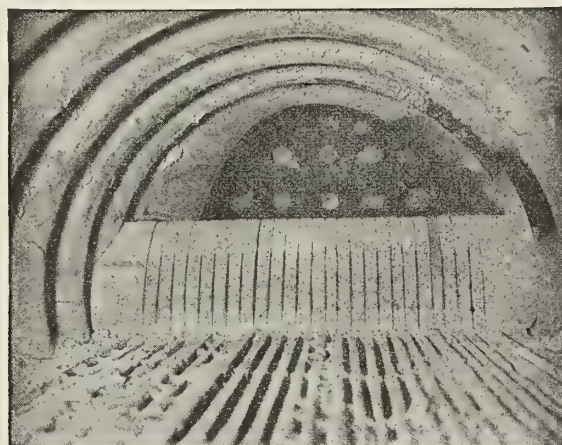
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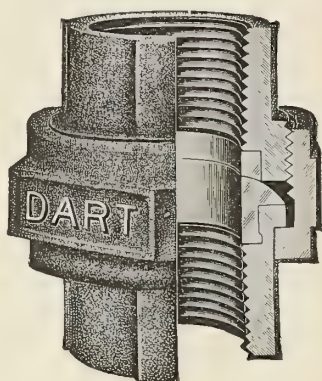
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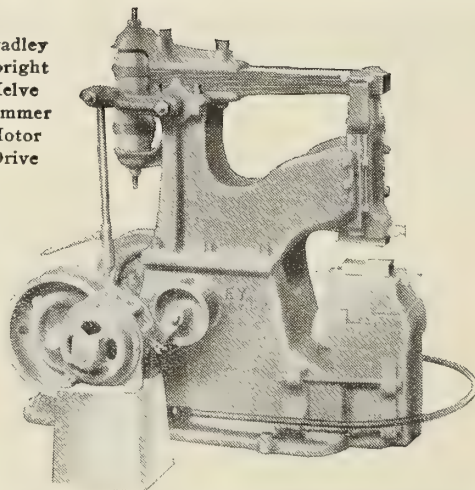
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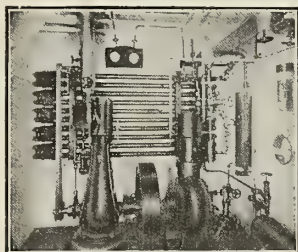
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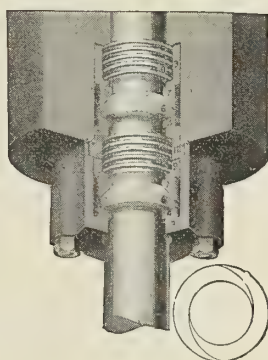
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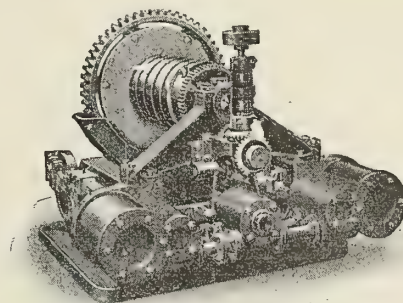
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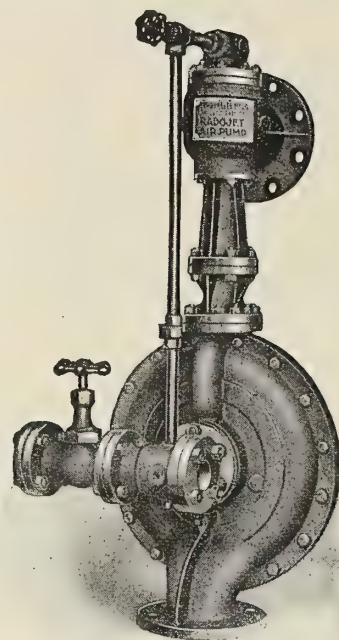
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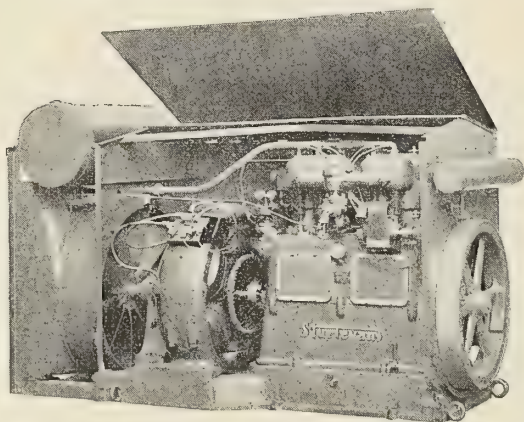
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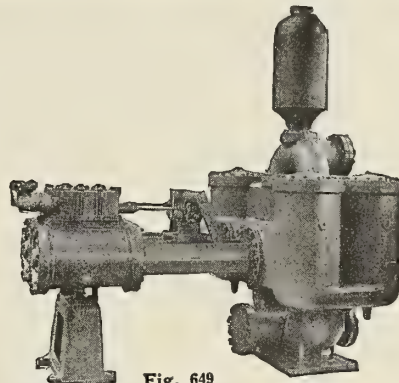


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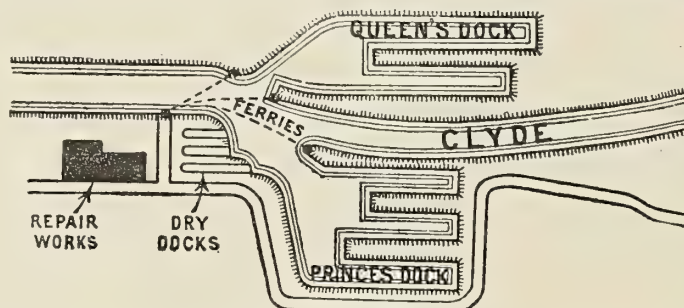
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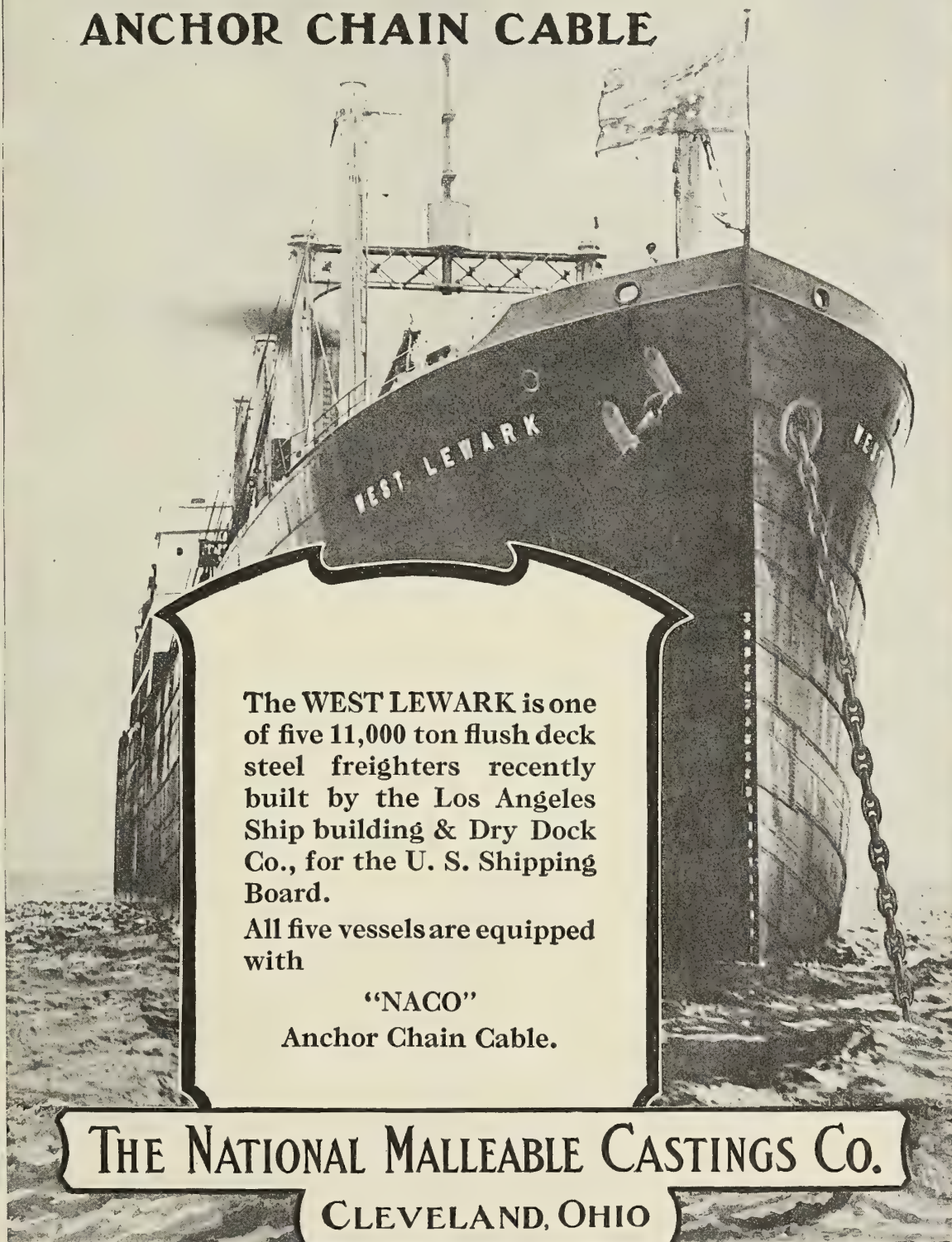
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Counters (See Revolution Counters)	Detaching Gear (Boat) American Balsa Co. Steward Davit & Equip. Corp.	Drop Hammers Chambersburg Engineering Co. Niles-Bement-Pond Co.	Electric Welding (See Welding, Electric)	Engines, Oil (Also see Diesel Engines) Busch-Sulzer Bros. Diesel Engine Co. Chicago Pneumatic Tool Co. Consolidated Shipbuilding Corp. Hadfield-Penfield Steel Co. Ingersoll-Rand Co. Johnson Iron Works, Ltd. Kearfott Engineering Co. McIntosh & Seymour Corp. New London Ship & Engine Co. Standard Motor Construction Co. Winton Engine Co.
Couplings (See Hose Couplings)	Diaphragm Pumps Hyde Windlass Co.	Dry Dock Pumps Alberger Pump & Condenser Co.	Electrical Appliances, Installations, Fittings and Supplies Chicago Fuse Mfg. Co. General Electric Co. Horne Mfg. Co. Williams, Wm. E.	Engines, Propelling Bath Iron Works Bethlehem Shipbuilding Corp. Consolidated Shipbuilding Corp. Fairbanks-Morse Co. Hadfield-Penfield Steel Co. Ingersoll-Rand Co. Kearfott Engineering Co. Los Angeles Shipbuilding & Dry Dock Co. McIntosh & Seymour Corp. New London Ship & Engine Co. Standard Motor Construction Co. Staten Island Shipbuilding Co. Trout Co., H. G. Ward, Chas., Engineering Works Winton Engine Co.
Coverings— Non-Conducting (See Non-conducting Coverings)	Dies Brubaker & Bros., W. L. Cleveland Punch & Shear Works Co. Williams, Wm. E.	Dry Docks (Manufacturer and Marine Railways) Bethlehem Shipbldg. Corp. Crandall Engineering Co.	Electrical Instruments General Electric Co. Horne Mfg. Co. Williams, Wm. E.	Engines, Pumping Alberger Pump & Condenser Co. Davidson Co., M. T. Fairbanks-Morse Co. Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc.
Cranes (Also see Floating Cranes and Shipyards Whirlers) American Balsa Co. American Engineering Co. Brown Hoisting Machinery Co. McMyler Interstate Co. Niles-Bement-Pond Co. Shepard Electric Crane & Hoist Co.	Diesel Engines (Also see Engines, Oil) Busch-Sulzer Bros. Diesel Engine Co. Hadfield-Penfield Steel Co. Kearfott Engineering Co. McIntosh & Seymour Corp. New London Ship & Engine Co. Winton Engine Works	Dry Docks and Marine Railways Baltimore Dry Docks & Shipbuilding Co. Bethlehem Shipbuilding Corp., Ltd. Charleston Dry Dock & Machine Co. Merchant Shipbuilding Corp. Newport News Shipbuilding & Dry Dock Co. Pensacola Shipbuilding Co. Shewan & Son, James, Co. Staten Island Shipbuilding Corp. Alex. Stephen & Sons, Ltd. Sun Shipbuilding Co. Todd Shipyards Corp. Yarrow & Co., Ltd.	Electrical Wiring Devices (Switches, Sockets, Etc.) Horne Mfg. Co. Williams, Wm. E.	Engine Room Clocks (See Clocks)
Crank Shafts Pollak Steel Co. Williams & Co., J. H.	Direct-Connected Sets (See Electrical Plants)	Dry Dock Pumps Alberger Pump & Condenser Co.	Elevators, Air and Hydraulic (Also see Portable Elevators)	
Cutters Williams, Wm. E.	Disengaging Gears American Balsa Co. Steward Davit & Equip. Corp.	Dynamometers (See Electric Plants)	Enclosed Cartridge Fuses Chicago Fuse Mfg. Co.	
Cutting Compounds Williams, Wm. E.	Distillers (See Evaporators)	Eccentric Rods Pollak Steel Co.	Engine Generating Sets B. F. Sturtevant Co.	
Cutting and Welding (See Welding)	Dock Fittings Williams, Wm. E.	Economizer, Fuel (See Fuel Economizer)	Engine Logs Williams, Wm. E.	
Cyclopedias—Shipbuilding Simmons-Boardman Pub. Co.	Draft Gauges Pneumercator Co. Williams, Wm. E.	Ejectors Lunkenheimer Co. Williams, Wm. E.	Engine Oil (See Lubricants)	
Cylinder Boring Bars Niles-Bement-Pond Co. Williams & Co., J. H.	Drain Valves (See Valves)	Electric Cutouts Chicago Fuse Mfg. Co. Horne Mfg. Co.	Engine Packing (See Packing)	
Cylinder Relief Valves (See Valves)	Dredging Machinery American Engineering Co. Flory Mfg. Co. Lidgerwood Mfg. Co. McMyler Interstate Co. J. S. Mundy Hoisting Engine Co.	Electric Cranes (See Electric Hoists)	Engine Room Counters (See Revolution Counters)	
Cylinders for Compressed Air, Gas, Etc. Continental Iron Works, The National Tube Co.	Drawing Materials (Board, Cloth, Paper, Ink, Etc.)	Electric Drills and Grinders Chicago Pneumatic Tool Co. General Electric Co. Williams, Wm. E.	Engineers, Consulting—Marine American Engineering Co. Bogert, J. L. Bonner, William T. Cathcart, Wm. L. Chapman & Fisher Christensen & Snethlage Crandall Engineering Co. Donnelly, W. T. Ferris, Theodore Jacobs Co., J. L. Haag, A. H. Haight, Robert S. Harris, Leonard B.	
Davits American Balsa Co. Steward Davit & Equip. Corp.	Drift Pins Cleveland Punch & Shear Works Co. Williams, Wm. E.	Electric Driven Pumps Alberger Pump & Condenser Co. Fairbanks-Morse Co. Ingersoll-Rand Co.		
Deck Fittings Steward Davit & Equip. Corp. Williams, Wm. E.	Drilling Machines Niles-Bement-Pond Co.	Electric Freight Trucks (See Freight-Handling)		
Deck Plates Sands & Son, A. B. Williams, Wm. E.	Drills Williams, Wm. E.	Electric Fire Alarm Systems Aero Alarm Co.		

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Life-saving Equipment

"Safest on the Sea"

TWO NEW STEWARD PRODUCTS

NON-TOPPLING AND NON-TWISTING BLOCKS

United States Steamboat Inspection Service,
General Rules and Regulations, Ocean—Rule III,
Paragraph 37, specifies:

"Where more than one lifeboat is served
under one set of davits, means shall be provided
that will prevent davit tackles from twisting or
capsizing, and that will permit the tackles
being readily rounded up for the purposes of
launching the remaining lifeboat under such
davits."

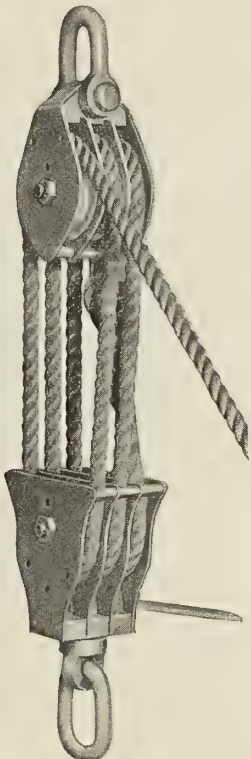
FEATURES OF THE STEWARD BLOCKS

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6. Accessible oil holes.
7. Special shackle for becket, if desired.
8. Exceptional strength, simple design.
9. Highest grade of workmanship.
10. No castings taking load.

WILL OUTLAST MANY
SETS OF INFERIOR CON-
STRUCTION.

SIZES—12" and 10" Treble.

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**SIMPLE AS A DOOR KNOB.
STRONG AS A GUN BREECH BLOCK**

The whole operation of loosening the dogs and opening the port is accomplished by merely turning one handle, and the breakage of glass by uneven pressure is avoided, as the port is opened and closed mechanically. This operation is controlled by one handle, which operates the ring gear, the four lugs releasing or wedging simultaneously, and the light opens or closes by means of a spiral gear worked by a spiral section of the ring gear. ALL sizes—with or without Deadlight. Write for Bulletin No. 52.

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Mechanical Davits—Lifeboats—Boat Releasing Gear—Line Throwing Guns—Non-Toppling and Non-Twisting Blocks—
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Engine Room Telegraphs Horne Mfg. Co. Williams, Wm. E.	Flanges American Spiral Pipe Works Crane Co., The Lunkenheimer Co., The Williams, Wm. E.	Fuel Oil Burners White Fuel Oil Engineering Corp. Williams, Wm. E.	Gauge Cocks Jerguson Gage & Valve Co. Lunkenheimer Co., The Powell Co., The William Sands & Son Co., A. B. Williams, Wm. E.	Grinders—Electric and Pneumatic Chicago Pneumatic Tool Co.
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Filters—Marine Oil Griscom-Russell Co. Kearfott Engineering Co. Row & Davis, Engineers, Inc. Williams, Wm. E.	Forgings, Iron and Steel (Also see Drop Forgings) Charleston Dry Dock & Machine Co. Pollak Steel Co.	Gas Engine Specialties Crane Co., The Lunkenheimer Co., The Powell Co., The William	Gate Valves — Brass and Iron Powell Co., The William Crane Co., The Lunkenheimer Co., The Pratt & Cady, Inc. Williams, Wm. E.	Hawse Pipes Ferguson-Herbert Corp'n
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Fire Department Supplies Kidde Co., Inc., Walter	Fire Economizer Griscom-Russell Co. Magnesia Association of America	Gate Valves for Tank Steamers Pratt & Cady Co., Inc. Williams, Wm. E.	Grate Bars Ferguson-Herbert Corp'n	Hawsers—Manila (Also see Rope and Wire Rope) American Mfg. Co. Columbian Rope Co. Plymouth Cordage Co. Whitlock Cordage Co. Williams, Wm. E.
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Fire Pumps Alberger Pump & Condenser Co. Warren Steam Pump Co.				Hemp (See Twine)
				Hoist Hooks Williams, J. H., & Co. Williams, Wm. E.
				Hoisting Engines Allan-Cunningham Co. American Engineering Co. Fairbanks-Morse Co. Flory Manufacturing Co., S. Hadfield-Penfield Steel Co. Hyde Windlass Co. Lidgerwood Mfg. Co. J. S. Mundy Hoisting Engine Co.



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Boston	*Charleston
*Philadelphia	*New Orleans
*Baltimore	*Baton Rouge

Pacific Coast Ports

Tacoma	*San Francisco
*Seattle	*San Pedro
*Point Wells	*San Diego
Astoria	*Honolulu
*Richmond	

CANADA

*Halifax	*Vancouver
*Montreal	Prince Rupert
*Levis (Quebec)	

MEXICO

Tampico

PANAMA CANAL

Cristobal	*Balboa
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WEST INDIES

Havana	Bermuda
Cienfuegos	Curacao
Nuevitas	St. Thomas
San Juan	

SOUTH AMERICA

Rio de Janeiro	Montevideo
Santos	Valparaiso
*Buenos Aires	*Talara
*Campana	

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UNITED KINGDOM

*Purfleet	*Liverpool
*Manchester	*Brixham
*Southampton	*Hull
*Newcastle-on-Tyne	
*Sunderland	*Thames Haven

GERMANY

Hamburg	Nordenham
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AFRICA

Bizerta

TURKEY

Constantinople

GREECE

Piraeus

CHINA

Hong Kong	Shanghai
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JAPAN

Itosaki	Nagasaki
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Arrangements will shortly be completed to cover ports in addition to those listed, as follows:

Toronto, Ont.	Pisagua, Chile	Gothenburg, Sweden	Rouen, France	Salonica, Greece
Fort William, Ont.	Tocopilla, Chile	Helsingfors, Finland	Havre, France	Bourgas, Bulgaria
Hamilton, Ont.	Taltal, Chile	Aalborg, Denmark	Marseilles, France	Smyrna, Turkey
Sarnia, Ont.	Paita, Peru	Copenhagen, Denmark	Dunkirk, France	Port Said, Egypt
Quebec (P. Q.)	Callao, Peru	Nyborg, Denmark	La Pallice, France	Alexandria, Egypt
St. John, N. B.	Bahia Blanca, Arg.	Avonmouth, U. K.	Genoa, Italy	Colombo, Ceylon
Victoria, B. C.	Ponta Delgada, Azores	Birkenhead, U. K.	Monopoli, Italy	Singapore, S. S.
Antilla, Cuba	Trondhjem, Norway	Cardiff, U. K.	Portici, Italy	Sydney, Australia
Matanzas, Cuba	Bergen, Norway	Rotterdam, Holland	Savona, Italy	Wellington, N. Z.
Antofagasta, Chile	Christiania, Norway	Amsterdam, Holland	Venice, Italy	Durban, S. A.
Iquique, Chile	Vallo, Norway	Antwerp, Belgium		

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Holisting and Transmission Rope (See Rope)	Interlocking Rubber Tiling Griscom-Russell Co.	Lights, Electric (See Electric Lights)	Marine Engineers (See Engineers, Consulting)	Mica Top Fuse Plugs Chicago Fuse Mfg. Co.
Hoists, Chain (See Chain Hoists)	Iron Cement. Smooth-on Mfg. Co.	Lines—Towing, Buoy (See Rope)	Marine Forgings (See Forgings)	Milling Machines Niles-Bement-Pond Co.
Hoists, Electric (See Electric Hoists)	Iron Pipe (See Pipe)	Loading and Unloading Equipment (See Freight-Handling Equipment)	Marine Glue Williams, Wm. E.	Mineral Wool (See Non-Conducting Covering)
Holders-On Chicago Pneumatic Tool Co. Ingersoll-Rand Co.	Iron Rust Remover The Rust Products Co.	Locks and Latches (See Ship Locks and Latches)	Marine Hardware Rostand Mfg. Co. Sands & Son Co., A. B. Tiebout, W. & J. Williams, Wm. E.	Mooring Engines American Engineering Co. Flory Mfg. Co., S. Hyde Windlass Co. Lidgerwood Mfg. Co.
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Hose Coupling Chicago Pneumatic Tool Co. Cleveland Pneumatic Tool Co. Ingersoll-Rand Co. U. S. Rubber Co.	Journal Bearings (See Thrust Bearings)	Lubricants Standard Oil Co. (New Jersey) Sun Co. Wadsworth, Howland & Co.	Marine Plumbing Crane Co., The Mott Iron Works, J. L. Sands & Son Co., A. B.	Motors, Gasoline (See Gasoline Engines)
Humidifiers Griscom-Russell Co.	Kerosene Engines Consolidated Shipbuilding Corp. Fairbanks-Morse Co. Standard Motor Construction Co.	Lubricating Oil Pumps Warren Steam Pump Co.	Marine Railway Builders Crandall Engineering Co.	Multiple Drills Niles-Bement-Pond Co.
Hydraulic Fittings Crane Co., The Lunkenheimer Co. Powell Co., The Watson-Stillman Co.	Ladder Treads Williams, Wm. E.	Lubricators Crane Co. Griscom-Russell Co. Lunkenheimer Co. Powell Co., The William Sun Co.	Marine Railways (See Dry Docks)	Multiple Punches Cleveland Punch & Shear Works Niles-Bement-Pond Co.
Hydraulic Presses and Other Machinery Niles-Bement-Pond Co. Warren Steam Pump Co. Watson-Stillman Co.	Ladle Heaters. Mahr Mfg. Co.	Machine Tools Cleveland Pneumatic Tool Co. Cleveland Punch & Shear Works Co. Niles-Bement-Pond Co.	Marine Ranges (See Ranges)	Multiwhirl Oil Coolers Griscom-Russell Co.
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Hygrodecks Taylor Instrument Companies	Lathe Dogs Williams & Co., J. H. Williams, Wm. E.	Manganese Bronze Castings American Manganese Bronze Co. Columbian Bronze Corp. Griscom-Russell Co. Hyde Windlass Co. Lunkenheimer Co. Powell Co., The William Sun Co.	Marine Repairs (See Shipbuilders)	Naval Architects Bogert, John L. Cathcart, Wm. L. Chapman & Fisher Christensen & Sneathlage Cox & Stevens Donnelly, William T. Ferris, Theodore Jacobs Co., J. L. Haag, A. H. Haight, Robert S. Harris, Leonard B. McClelland, N. E., & Co., Ltd. McKinlay, James Matthews, John B. Nilson, Leonard J. Peerless Eng. Co. Rimmer, A. C. Rossell & Thayer Sharp, Geo. G. Tams, Lemoine & Crane Watts, J. Murray Whittelsey & Whittelsey C. V. S. Wyckoff
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Ice Machines (See Refrigerating Machinery)	Launching Grease Sun Co.	Malleable and Steel Castings Crane Co.	Marine Shafting (See Shafting)	Nipples Crane Co., The Lunkenheimer Co., The
Indicator Connections Lunkenheimer Co. Powell Co., The William Sun Co.	Lavatories (Stateroom) Crane Co., The Mott Iron Works, J. L. Sands, A. B., & Son Co. Williams, Wm. E.	Manila and Sisal Rope (See Rope)	Marine Specialties (See Steam Specialties)	Non-Conducting Coverings Magnesia Association of America Thorsen, P. S., & Co., Inc.
Indicators (Steam and Gas Engine) Ashton Valve Co. Lunkenheimer Co., The Powell Co., The William Sun Co.	Lavatory and Bath Heaters Griscom-Russell Co. Sands, A. B., & Son Co. Williams, Wm. E.	Manifolds Cleveland Pneumatic Tool Co.	Marine Superheaters Babcock & Wilcox Co. Power Specialty Co. Superheater Co., The	Non-Toppling Blocks American Balsa Co. Steward Davit & Equipment Corp.
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	Life Preservers American Balsa Co. Williams, Wm. E.	Marine Decking (See Decking)	Mechanical Telegraphs Horne Mfg. Co. Radio Corporation of America Williams, Wm. E.	
	Life-Saving Devices American Balsa Co. Steward Davit & Equip. Corp.	Marine Electrical Equipment (See Electrical Fittings and Supplies)	Metallic Packing (Also see Packing) Goetze Gaske & Packing Co. U. S. Metallic Packing Co.	
	Lighting Sets (See Electric Plants)	Marine Engines (See Engines, Propelling)	Meters, Electric General Electric Co.	

What Balsa Insulation Means to the Shipowner and Shipbuilder

BALSA insulation, economical in maintenance of refrigerated ship spaces and practical in the simplicity of its installation, provides the solution for the many difficulties heretofore encountered in construction and upkeep. By the use of Balsa full insulating values are maintained, without replacement, year after year; there is a saving of as much as fifty percent of the weight of the insulating structure; thinner walls increase the available cargo space; and the original cost of the completed structure is less than with other good materials.



In the last eighteen months more than a million board feet of Balsa insulation have been installed following the thorough development of its use during the last ten years. Methods of treatment that retain the high insulating value of this lightest of all woods, have been fully proven. Standard plans of installation have been established. Balsa has met successfully all those tests and conditions to which an extended period of actual use has subjected it. Its use has brought about a new appreciation of the possibilities of economical ship insulation.

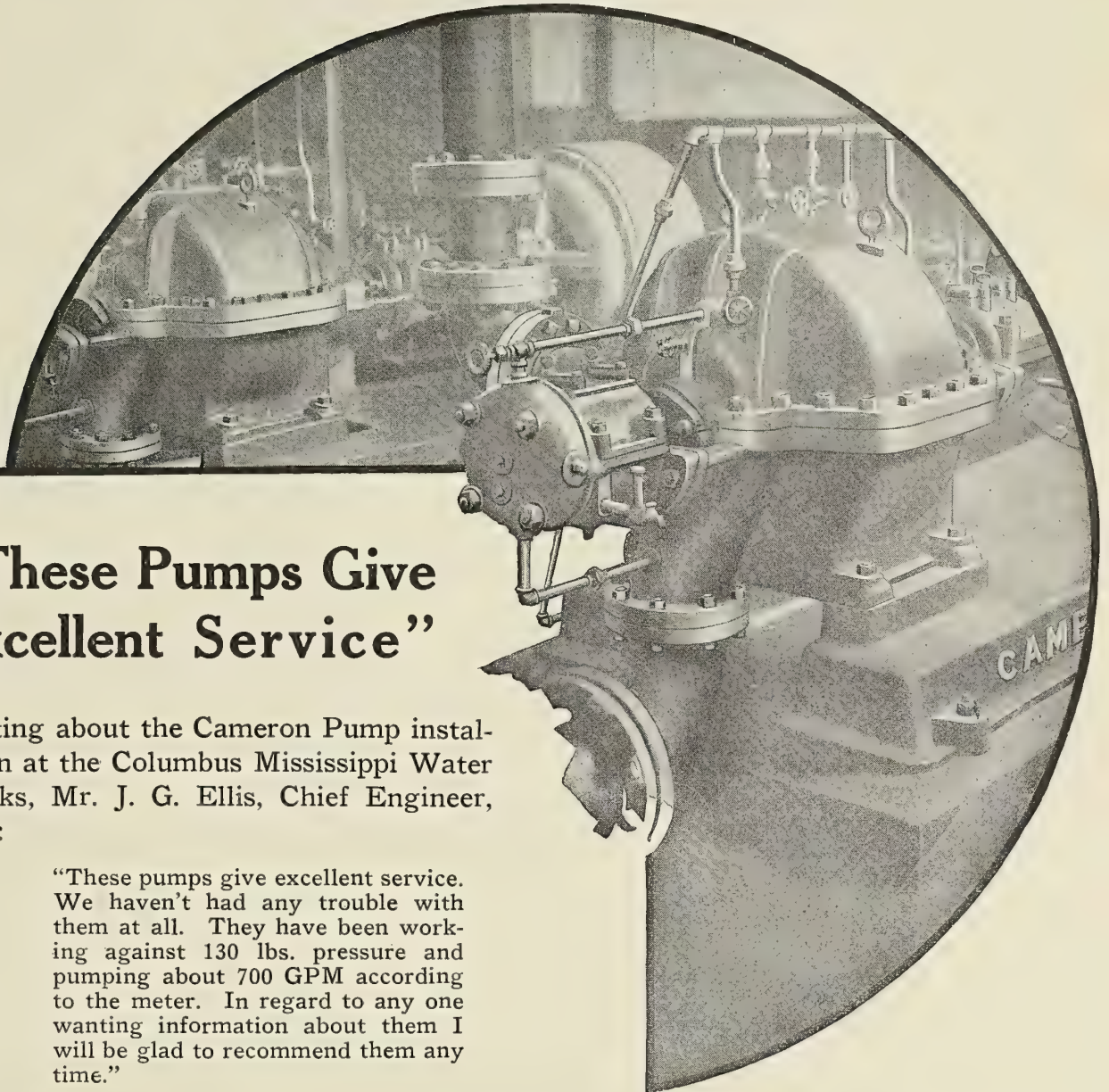
ADVANTAGES OF Balsa SHIP INSULATION

- 1 Balsa is supplied in large panels having a structural strength fully half that of spruce.
- 2 Balsa requires little studding and only a single layer of sheathing for surface protection.
- 3 Its resistance to heat transmission is equal to that of other high grade insulating materials.
- 4 Balsa is even lighter than cork, and the weight of a completed installation is fully 50% less.
- 5 Permanence of structure and of insulating efficiency is obtained through exclusion of moisture.
- 6 Balsa panels are easily installed, a small number of tight fitting joints minimizing heat leakage.
- 7 Removable sections can be installed to permit ready inspection of ship's hull for painting or repairs.
- 8 Metal sheathed Balsa panels are available for insulation of boiler room hatches and crew quarters.

An article which appeared in the July, 1921, issue of International Marine Engineering, describing Balsa ship insulation, and including detailed drawings showing standard plans of installation, has been reprinted for distribution to those interested. May we send you a copy of this article?

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305 Vernon Ave., Long Island City, New York

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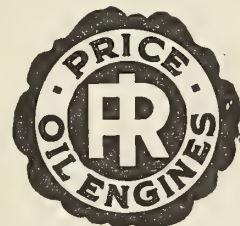
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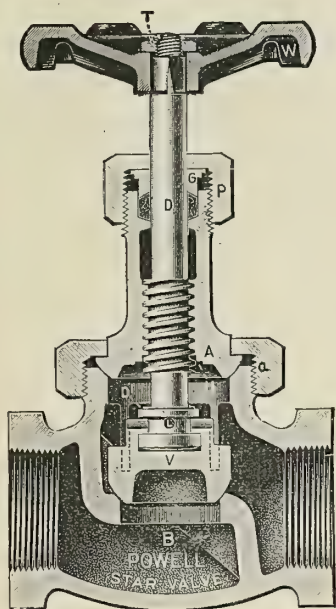
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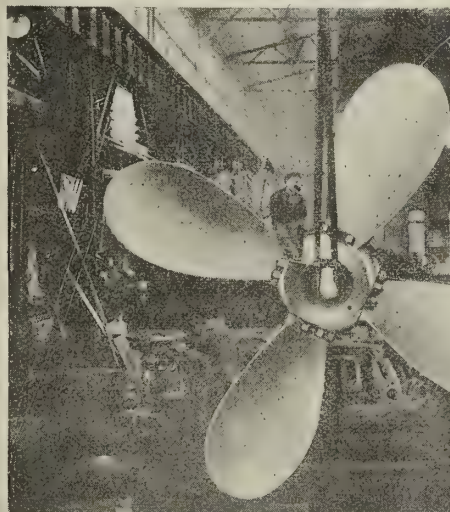
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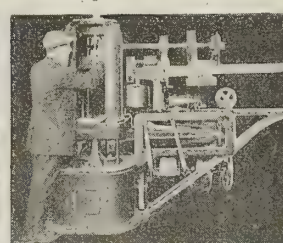
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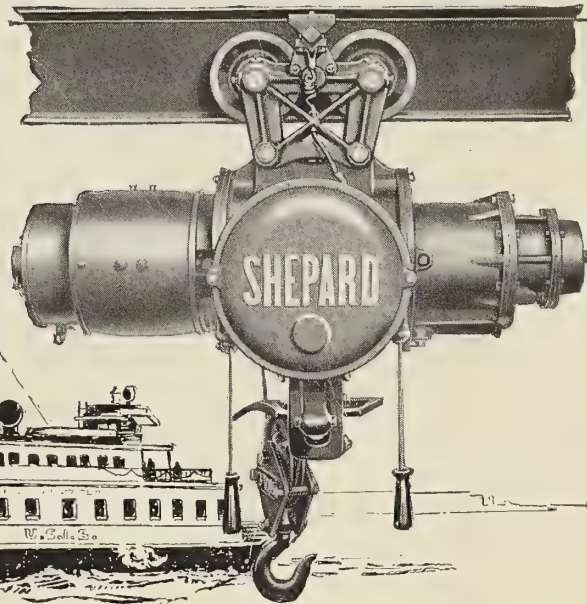
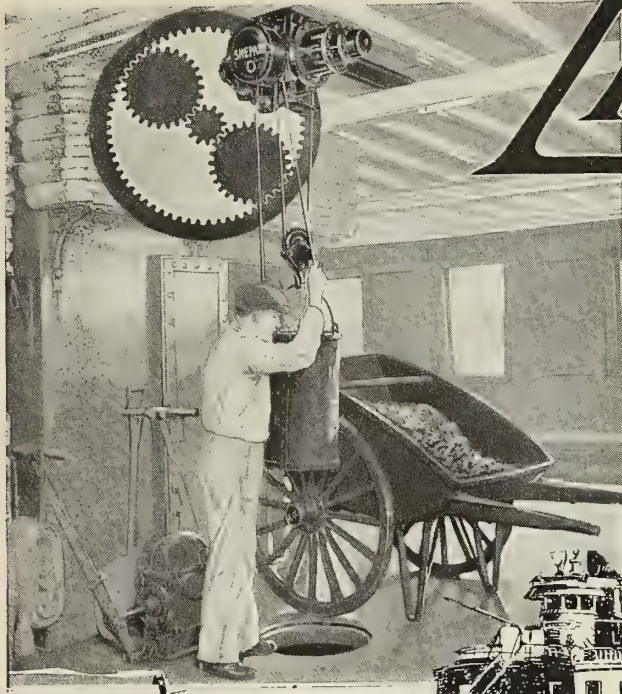
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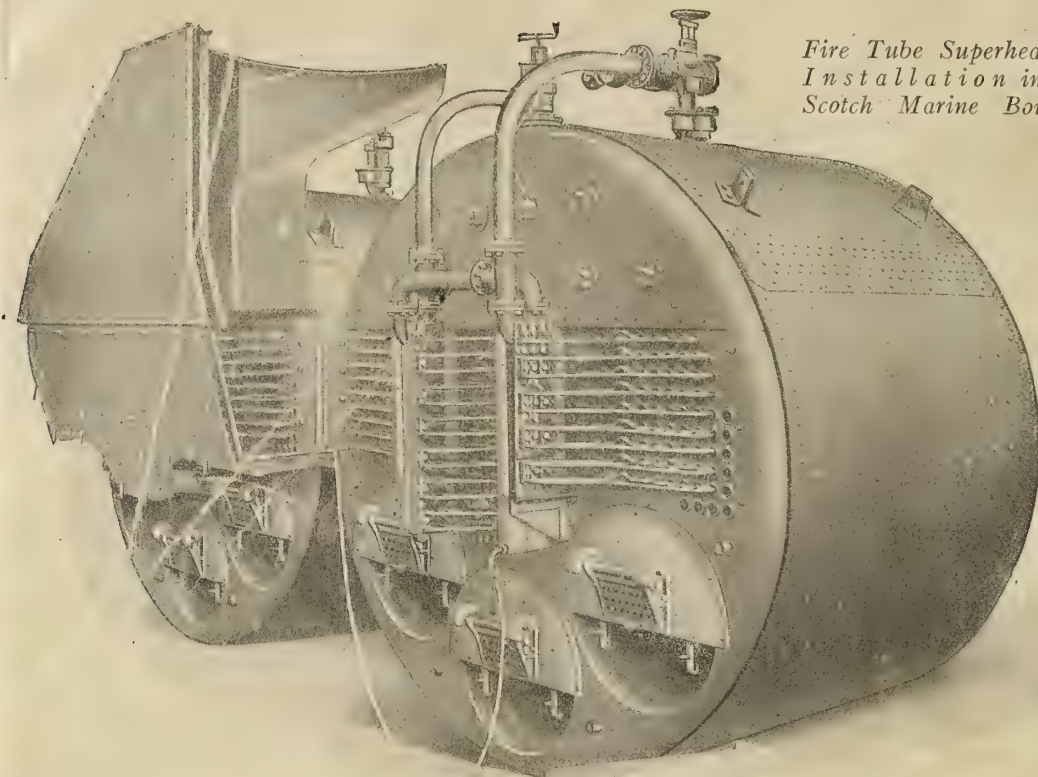
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